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# RELIABILITY OF SCORES FOR FISCAL YEAR 1981 ARMY APPLICANTS: ARMED SERVICES VOCATIONAL APTITUDE BATTERY FORMS 8, 9, AND 10

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Subtest scores achieved by enlistment accessions on the Armed Services Vocational Aptitude Battery (ASVAB) are used to select and classify applicants in Army Military Occupational Specialties (MOS). Research is underway to validate ASVAB scores for prediction of job performance in the Army. This report describes a research effort to evaluate the accuracy of recorded ASVAB subtest scores. The results of the reliability research indicate that reported scores were consistent with the ASVAB subtest scores computed by an independent contractor, using the same raw data. In addition, analyses were made of a

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sample of FY 1981 Army applicants who repeated the ASVAB, having failed to achieve the required cut-score on the first test. These applicants showed greatest improvement on the speeded subtests.

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## FOREWORD

The Armed Services Vocational Aptitude Battery is a multiaptitude test battery used for selection and classification of United States military personnel. Major Army research efforts are underway which are directed at relating scores achieved by enlisted accessions on this test to performance and success in training and on the job. The purpose of this research was to verify the reliability of the reported scores to ensure that validation research was grounded on accurate ASVAB test scores. The results of this research verify that scoring and reporting of the ASVAB results at MEPCOM installations is reasonably accurate.

Research also was conducted to examine the test score changes for applicants who failed to achieve the required ASVAB cut scores for enlistment. The results of this research indicate that these applicants showed greatest change in the speeded subtests of the ASVAB.

This research was carried out under contract by RESEARCH APPLICATIONS, INCORPORATED of Rockville, Maryland under the direction of the Selection and Classification Technical Area in response to the requirements of Army Project No. 2Q263731A792.

STUDY OF THE RELIABILITY OF SCORES FOR FISCAL YEAR 1981 ARMY APPLICANTS: ARMED SERVICES VOCATIONAL APTITUDE BATTERY FORMS 8, 9 AND 10

## BRIEF


REQUIREMENTS:

To assess the accuracy of Armed Services Vocational Aptitude Battery (ASVAB) subtest scores as reported by Military Enlistment Processing Command (MEPCOM) Military Entrance Processing Stations (MEPS), and the contracted Mobile Examining Test (MET) sites for purposes of establishing a reliable FY 1981 Army applicant data base.

PROCEDURES:

Answer sheets completed by initial test applicants for the U.S. Army were rescored by an independent contractor. The scores reported by the MEPS for each subtest of the ASVAB were compared to the scores computed for each subtest of the ASVAB by the independent contractor. Also, an analysis of test-retest scores achieved by the Army applicants was conducted using ASVAB score data reported by the MEPS.

FINDINGS:

More than 143,000 Army applicants had matching MEPS and contractor-scored ASVAB data. A subtest comparison of test scores indicated that the mean of six of the ten subtest scores reported by the MEPS differed from those computed by the contractor. However, computations of the AFQT and Army Combat composite indicated agreement in the classification of applicants in approximately 97% and 94% of the cases, respectively. The analyses of the data for those applicants who took the ASVAB twice showed that retesting raised speeded test scores achieved by this group to the level of those applicants who did not retest. There was little or no change in the scores for the power tests.

UTILIZATION:

The results of the test score comparison verify the accuracy of scores reported by the MEPS. The retested applicants improved their scores on the two speeded tests, and on two of the eight power tests. However, all power subtest scores remained significantly lower than those achieved by one-time ASVAB examinees.

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## INTRODUCTION

The U.S. Army, along with the other major branches of the military service, uses the Armed Services Vocational Aptitude Battery (ASVAB) for selection and classification of enlistees. A long-term major research effort is being initiated by the Army to relate the scores achieved on this test to performance in training and on the job.

The ASVAB tests are administered throughout the United States through a large testing network. The network consists of 68 Military Entrance Processing Stations (MEPS) and numerous satellite testing locations, or Mobile Examining Test Sites (METS). The test scores are computed at the MEPS and forwarded to a central registry to develop a record for each applicant.

In FY 1981, there were more than 490,000 applicants for the Army. The accuracy of the scoring of the ASVAB at the MEPS is of great interest to the Army, because of the need to have reliable ASVAB score data on the FY 1981 accession cohort. To evaluate the accuracy of ASVAB test scores reported by the MEPS required rescreening the original ASVAB answer sheets and comparison of the two sets of scores.

Included in the FY 1981 applicant pool were almost 30,000 individuals who failed to qualify for enlistment based on their initial scores on the ASVAB and who were retested. Data were available from MEPS files to examine the changes in their test scores as a result of repeated administration of the ASVAB and to compare these changes with those scores achieved by single administration applicants.

The work conducted in this research, therefore, was carried out in two concurrent efforts. The first effort was designed to yield information about the reliability of the ASVAB test scores as reported by the MEPS. The second effort was designed to examine the effects of retesting on scores achieved by applicants who failed to attain a minimally acceptable score for enlistment on previous test administrations. The methods, procedures and results of the data analyses followed in each effort are described in turn in the remainder of this report.

## PART I. RELIABILITY OF MEPS-REPORTED ASVAB SCORES

The ASVAB consists of ten subtests administered during a two-hour and forty-five minute session to screen applicants for military service. Each of the major branches of the service use a composite of four of the subtests, Word Knowledge (WK), Arithmetic Reasoning (AR), Paragraph Comprehension (PC) and Numerical Operations (NO) as a minimum criterion for acceptance. This composite is known as the Armed Forces Qualifying Test (AFQT).

The remaining six subtests of the ASVAB are combined in various ways with some of the AFQT subtests to form composites of specific interest to branches of the military for initial classification of the applicants. The Combat Composite (CO) consisting of the Coding Speed (CS), Mechnical Comprehension (MC) and Auto/Shop Information (AS) subtests, and the Electronics Composite (EL) consisting of the General Science (GS), Mathematics Knowledge (MK) and Electronics Information (EI) subtests are two of those which are used by the Army to further classify applicants for initial assignment. Both the raw subtest scores and the scores for the AFQT, CO and EL composites were compared using a large number of original test answer sheets sent to the Army by the MEPS.

### METHOD

In fiscal year 1981, more than 198,000 Army applicants who took the ASVAB on one occasion only were identified for the study through submission of original test responses by the MEPS.

To prepare the test answer sheets for scanning, the project staff first performed a sorting routine in which the answer sheets designated for services other than the Army, those for the Army National Guard and Reserves, and also the Army retests and verifications, were separated from the Active Army initial test responses.

It was expected that the MEPS would provide completed answer sheets covering all of the months from October 1980 through September 1981. It was found that for a majority of the MEPS, answer sheets for some of these months were missing. In most cases, the answer sheets missing were those for the months before April 1981. The fact that answer sheets for several months of testing would not be available for study resulted in ARI's decision to abandon plans for analysis of these data by month of testing.

In a number of cases, social security numbers and other demographic and identification data were missing from the answer sheets. Where possible, these data were copied from the computer sheets attached to the answer sheets. Where computer sheets were not available, the ARI applicant file was used to categorize the examinee. However, since the data were merged with the ARI applicant file by social security number, missing or incompletely filled in social security numbers resulted in some loss of data.

Other losses occurred in the data preparation process. Many of the MEPS had sent answer sheets with the pages stapled together. The optical scanning machines tended to reject answer sheets with staple holes in the area of the sequence number.

Preprocessing computer programs eliminated 15,214 records with bad social security numbers and 224 data sets with bad test versions. In all, 183,413 ASVAB data sets were scored; and 149,825 one-time only records were successfully merged with the ARI applicant file. Given the estimate of 490,000 Army applicants, the number of records matched by the contractor represented 31% of the total applicant data file provided by the MEPS.

## ANALYSES

A series of analyses was conducted on the initial test takers only Army applicant pool to examine the reliability of the MEPS reported tested scores. The applicant data pool was initially screened to eliminate those individuals with out-of-range or missing scores from any one of the ten subtests. The applications of this procedure yielded a final applicant pool of 143,279 for analysis.

## RESULTS

Using the responses from the initial test only data base, the mean and standard deviation of each of the subtest scores were computed for all matched applicant data sets. A comparison of the differences between the means indicated that, although for six of the ten subtests of the ASVAB significant differences were detected (see Table 1), only the mean difference in scores for Coding Speed (CS) appeared large enough to require further examination. The comparative score data revealed that the greatest number of scores which did not match was in the CS subtest. A count was made of the number of MEPS by percent of matching CS scores for males. Only one MEPS had a 100% match; but there were only 17 cases in the data base for this MEPS. In general, most of the MEPS (62 in all) had matched CS subtest scores for males for between 70% and 90% of the male cases. Almost half of the MEPS (29) had matched scores for between 80% and 84% of the cases.

The results of a factor analysis of the subtest scores achieved by this group were consistent with findings from other factor analyses research of ASVAB test scores. Two factors, power and speed, emerged for the analyses.

The AFQT, CO and EL composites were computed to examine the differences in classification of initial test only based on contractor and MEPS reported data.

The AFQT composite score was computed using MEPS reported and contractor compiled scores for the matched groups of applicants. The AFQT consists of the sum of the scores obtained on the AR, WK and PC subtests and one-half of the score obtained on the NO subtest. The AFQT raw score composites were

TABLE 1. Comparison of MEPCOM and Contractor Scored Sample Subtest Means.

| Subtest Name | Number of Items | MEPCOM $\bar{x}$ | MEPCOM sd | CONTRACTOR $\bar{x}$ | CONTRACTOR sd | z |
|---|---|---|---|---|---|---|
| General Science (GS) | 25 | 13.906 | 5.323 | 13.893 | 5.319 | 0.654 |
| Arithmetic Reasoning (AR) | 30 | 15.974 | 6.879 | 15.954 | 6.875 | 0.779 |
| Word Knowledge (WK) | 35 | 22.433 | 8.129 | 22.307 | 8.148 | 4.154 |
| Paragraph Comprehension (PC) | 15 | 9.368 | 3.586 | 9.331 | 3.604 | 2.758 |
| Numerical Operations (NO) | 50 | 33.433 | 10.634 | 33.319 | 10.708 | 2.860 |
| Coding Speed (CS) | 84 | 41.983 | 15.052 | 41.695 | 15.013 | 5.128 |
| Auto/Shop Information (AS) | 25 | 14.486 | 5.705 | 14.433 | 5.724 | 2.482 |
| Mathematics Knowledge (MK) | 25 | 10.956 | 5.218 | 10.932 | 5.216 | 1.231 |
| Mechanical Comprehension (MC) | 25 | 13.321 | 5.184 | 13.292 | 5.188 | 0.474 |
| Electronics Information (EI) | 20 | 10.957 | 4.063 | 10.905 | 4.073 | 3.430 |

N = 143,279

converted to the categories used by the Armed Forces for enlistment. The number of applicants was tabulated by AFQT category for each AFQT composite (see Table 2). The breakdowns for the AFQT categories are as follows:

| AFQT Category | AFQT Raw Score Range |
|---|---|
| I | 101-105 |
| II | 84-100 |
| IIIA | 76- 83 |
| IIIB | 65- 75 |
| IVA | 56- 64 |
| IVB | 49- 55 |
| IVC | 38- 48 |
| V | 0- 37 |

The number of applicants who changed from one AFQT category to another based on these computations was seen as an indication of the error associated with scoring these subtests. Since the shift in the applicants' AFQT category could be the result of errors made by both the MEPS and the contractor in scoring the test, it was determined that any estimate of the error in classification should be adjusted empirically. In this case, the number of applicants one cell to the left and right of the category on the diagonal would be used to estimate the error of assignment.

A simple difference between these two values was computed and an average error rate was estimated for cell categories. There appears to be an estimated error rate of ±1.37% by the MEPS in assigning applicants to mental categories. Based on the AFQT scores of 490,000 Army applicants who were tested during FY 1981, this error rate would translate to a little more than 6,700 applicants.

A similar error rate analysis was performed using transformed subtest scores which constitute the CO and EL composites. The CO composite consists of a sum of the transformed AR, CS, MC and AS subtest scores (see Table 3). The average error rate computed for this composite was ±2.10%. Again, for the estimated total of 490,000 applicants this error rate translates into approximately 10,300 persons. The EL composite consists of a sum of the transformed GS, AR, MK and EI subtests scores (see Table 4). The average error rate computed for this composite was ±2.14%. This error rate translates into approximately 10,500 persons for this composite.

## DISCUSSION

The results of the comparison of the MEPS-reported ASVAB scores and the contractor computed ASVAB scores showed that there were few discrepancies found. As with previous efforts conducted by ARI, on smaller samples of applicants, the greatest number of disparate score comparisons was identified with the CS subtest. The differences in score reporting for this subtest may be attributable to factors such as mistiming and misscoring of the items. Furthermore, the error rate in categorizing applicants by composite also was found to be minimal (see Tables 5, 6 and 7).

TABLE 2. Comparison of AFQT Category Assignment Based on AFQT Scores Computed by Contractor and Reported by MEPS: FY 1981 Applicants.*

| MEPS Reported Score Composite Category | Contractor Scored AFQT Mental Category | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | II | IIIA | IIIB | IVA | IVB | IVC | V | |
| | AFQT Raw Score Range | | | | | | | | |
| | 101-105 | 84-100 | 76-83 | 65-75 | 56-64 | 49-55 | 38-48 | 0-37 | Total |
| I | 3,137 | 85 | 7 | 2 | 0 | 0 | 3 | 6 | 3,240 |
| II | 26 | 26,964 | 310 | 144 | 20 | 7 | 21 | 33 | 27,525 |
| IIIA | 0 | 73 | 16,327 | 361 | 53 | 17 | 14 | 38 | 16,883 |
| IIIA | 2 | 15 | 64 | 25,464 | 434 | 70 | 25 | 67 | 26,141 |
| IVA | 0 | 4 | 7 | 110 | 19,015 | 355 | 91 | 42 | 19,624 |
| IVB | 0 | 0 | 1 | 7 | 127 | 14,415 | 378 | 72 | 15,000 |
| IVC | 0 | 4 | 1 | 7 | 23 | 144 | 18,560 | 354 | 19,093 |
| V | 0 | 5 | 2 | 4 | 10 | 17 | 127 | 15,590 | 15,755 |
| Total | 3,165 | 27,154 | 16,720 | 26,099 | 19,683 | 15,028 | 19,220 | 16,205 | 143,279 |
| % of Total | 2.2 | 19.0 | 11.7 | 18.2 | 13.7 | 10.5 | 13.4 | 11.3 | 100.0 |

*AFQT = AR + WK + PC + 1/2NO.

TABLE 3. Comparison of Army Combat (CO) Composite Category Assignments Based on Scores Computed by Contractor and Reported by MEPS: FY 1981 Applicants.*

| MEPS Reported Score Composite Category | Contractor Scored Composite Category | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 | Total |
| 120+ | 11,872 | 291 | 23 | 25 | 12 | 17 | 12 | 6 | 19 | 12,277 |
| 110-119 | 81 | 15,586 | 333 | 118 | 30 | 19 | 16 | 18 | 46 | 16,247 |
| 105-109 | 12 | 84 | 8,532 | 299 | 33 | 34 | 13 | 9 | 26 | 9,042 |
| 100-104 | 12 | 30 | 116 | 13,492 | 338 | 72 | 32 | 16 | 70 | 14,178 |
| 95-99 | 4 | 13 | 23 | 129 | 11,398 | 371 | 70 | 27 | 60 | 12,095 |
| 90-94 | 6 | 12 | 4 | 34 | 112 | 11,585 | 388 | 67 | 93 | 12,301 |
| 85-89 | 4 | 4 | 4 | 12 | 27 | 147 | 12,192 | 374 | 159 | 12,923 |
| 80-84 | 1 | 2 | 6 | 4 | 16 | 31 | 128 | 10,301 | 481 | 10,970 |
| 40-79 | 4 | 9 | 7 | 18 | 23 | 30 | 81 | 208 | 42,861 | 43,241 |
| Total | 11,996 | 16,034 | 9,048 | 14,133 | 11,989 | 12,306 | 12,932 | 11,026 | 43,815 | 143,279 |
| % of Total | 8.4 | 11.2 | 6.3 | 9.9 | 8.4 | 8.6 | 9.0 | 7.7 | 30.5 | 100.0 |

*CO = AR + AS + MC + CS

TABLE 4. Comparison of Army Electronics (EL) Composite Category Assignments Based on Scores Computed by Contractor and Reported by MEPS: FY 1981 Applicants.*

| MEPS Reported Score Composite Category | Contractor Scored Composite Category | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 | Total |
| 120+ | 11,829 | 136 | 19 | 11 | 13 | 6 | 3 | 2 | 6 | 12,025 |
| 110-119 | 42 | 16,727 | 166 | 84 | 27 | 23 | 19 | 6 | 11 | 17,105 |
| 105-109 | 4 | 50 | 9,204 | 130 | 39 | 30 | 7 | 8 | 13 | 9,485 |
| 100-104 | 3 | 10 | 44 | 11,785 | 154 | 75 | 28 | 21 | 26 | 12,146 |
| 95-99 | 0 | 3 | 7 | 51 | 10,482 | 165 | 45 | 27 | 30 | 10,810 |
| 90-94 | 1 | 5 | 8 | 19 | 74 | 12,835 | 191 | 78 | 72 | 13,283 |
| 85-89 | 0 | 2 | 0 | 3 | 13 | 91 | 10,371 | 178 | 119 | 10,777 |
| 80-84 | 3 | 1 | 2 | 3 | 9 | 17 | 80 | 10,615 | 282 | 11,012 |
| 40-79 | 4 | 8 | 3 | 4 | 9 | 27 | 31 | 124 | 46,422 | 46,632 |
| Total | 11,886 | 16,943 | 9,453 | 12,090 | 10,820 | 13,270 | 10,775 | 11,060 | 46,982 | 143,279 |
| % of Total | 8.3 | 11.8 | 6.6 | 8.4 | 7.6 | 9.3 | 7.5 | 7.7 | 32.8 | 100.0 |

*EL = GS + AR + MK + EI

TABLE 5. Rescoring Shifts in AFQT Assigned Mental Category in Percents for MEPCOM and Contractor Scored FY 1981 Army Applicants*, N = 143,279.

| MEPS Reported Score Mental Category | Contractor Computed Score Mental Category | | | | | | |
|---|---|---|---|---|---|---|---|
| | V | IVC | IVB | IVA | IIIB | IIIA | II&I |
| I&II | 0 | 0 | 0 | 0 | 1 | 2 | 100 |
| IIIA | 0 | 0 | 0 | 0 | 1 | 98 | 0 |
| IIIB | 0 | 0 | 0 | 2 | 98 | 0 | 0 |
| IVA | 0 | 0 | 2 | 97 | 0 | 0 | 0 |
| IVB | 0 | 2 | 96 | 1 | 0 | 0 | 0 |
| IVC | 2 | 97 | 1 | 1 | 0 | 0 | 0 |
| V | 96 | 1 | 0 | 0 | 0 | 0 | 0 |
| % of Total | 11 | 13 | 11 | 14 | 18 | 12 | 21 |

*AFQT = AR + WK + PC + 1/2NO

TABLE 6. Rescoring Shifts in CO Composite in Percents for MEPCOM and Contractor Scored FY 1981 Army Applicants*, N = 143,279.

| MEPS Reported Score | Contractor Computed Score | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 |
| 120+ | 99 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110-119 | 1 | 97 | 4 | 1 | 0 | 0 | 0 | 0 | 0 |
| 105-109 | 0 | 1 | 94 | 2 | 0 | 0 | 0 | 0 | 0 |
| 100-104 | 0 | 0 | 1 | 95 | 3 | 1 | 0 | 0 | 0 |
| 95-99 | 0 | 0 | 0 | 1 | 95 | 3 | 1 | 0 | 0 |
| 90-94 | 0 | 0 | 0 | 0 | 1 | 94 | 3 | 1 | 0 |
| 85-89 | 0 | 0 | 0 | 0 | 0 | 1 | 94 | 3 | 0 |
| 80-84 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 93 | 1 |
| 40-79 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 38 |
| % of Total** | 8 | 11 | 6 | 10 | 8 | 9 | 9 | 8 | 30 |

*CO = AR + AS + MC + CS
**May not total 100 due to rounding

TABLE 7. Rescoring Shifts in EL Composite in Percents for MEPCOM and Contractor Scored FY 1981 Army Applicants*, N = 143,279.

| MEPS Reported Score | Contractor Computed Score | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 |
| 120+ | 100 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110-119 | 0 | 99 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 105-109 | 0 | 0 | 97 | 1 | 0 | 0 | 0 | 0 | 0 |
| 100-104 | 0 | 0 | 0 | 98 | 1 | 1 | 0 | 0 | 0 |
| 95-99 | 0 | 0 | 0 | 0 | 97 | 1 | 0 | 0 | 0 |
| 90-94 | 0 | 0 | 0 | 0 | 1 | 97 | 2 | 1 | 0 |
| 85-89 | 0 | 0 | 0 | 0 | 0 | 1 | 96 | 2 | 0 |
| 80-84 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 96 | 1 |
| 40-79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 99 |
| % of Total** | 8 | 12 | 7 | 8 | 8 | 9 | 8 | 8 | 33 |

*EL = GS + AR + MK + EI
**May not total 100 due to rounding

## PART II. RETEST APPLICANT STUDY

More than 36,000 applicants were identified who had two sets of ASVAB scores reported on their record, indicating that they may have taken the battery on more than one occasion. A number of those individuals, however, were found to have been given a verification form of the ASVAB as a result of scoring inconsistencies or suspect test taking. These individuals were removed from the larger group who were considered to be retested applicants. Furthermore, applicants whose subtest scores on all ten subtests were found to be the same for the two sets of scores reported were dropped from the data base. Finally, if the sum of the AFQT composite exceeded the raw score maximum, these applicants were dropped from further analyses. From the original pool of 36,000 applicants, 27,911 were identified as having been retested.

### METHOD

A series of analyses was conducted on the retest army applicant pool to examine the differences in the test scores of those applicants whose records indicated that they had taken the ASVAB more than once. The two most recent scores were used for comparison purposes.

The initial and retest scores were factor analyzed. Mean and standard deviations of the initial and retest scores were compared for each subtest. Comparisons of the AFQT, CO and EL composite scores for retested applicants were made.

### RESULTS

A tabulation of the number of individuals who took the ASVAB on two different occasions is shown in Table 8. As can be seen from this table, 1,774 (6%) of the individuals appeared to have taken the same version as both initial and retests. Given this number, it was determined that further analyses of the retest data would be conducted separately for this group of individuals.

A comparison of the mean subtest scores for all retested applicants yielded the same results for both groups; that is, those who took the same version of the ASVAB as a retest and those who took different versions of the ASVAB as a retest (see Tables 9 and 10). A graph of the frequency distributions of the retest scores for the Word Knowledge subtest shows similar distributions for both groups (see Figures 1 and 2). Further support for these results are demonstrated in the graphs of initial and retest mean scores and plots of the reciprocal of the standard deviation of each mean retest score for the Word Knowledge subtest presented in Figures 3 and 4, respectively.[1]

[1]Graphic distributions for all subtests may be found in the Appendices.

TABLE 8. Number of Initial and Retested FY 1981 Army Applicants by ASVAB Operational Test Version.

| Number Taking Retest of Test Version | Number Taking Initial Test of Test Version | | | | | | |
|---|---|---|---|---|---|---|---|
| | 8A | 8B | 9A | 9B | 10A | 10B | Total |
| 8A | 354 | 669 | 1,042 | 983 | 932 | 954 | 4,934 |
| 8B | 700 | 328 | 1,035 | 841 | 957 | 832 | 4,693 |
| 9A | 1,029 | 1,061 | 310 | 600 | 873 | 906 | 4,779 |
| 9B | 1,012 | 871 | 660 | 258 | 919 | 702 | 4,422 |
| 10A | 954 | 989 | 973 | 877 | 273 | 517 | 4,583 |
| 10B | 1,050 | 830 | 969 | 799 | 601 | 251 | 4,500 |
| Total | 5,099 | 4,748 | 4,989 | 4,358 | 4,555 | 4,166 | 27,911 |

TABLE 9. Comparison of Mean Subtest Scores for Retested Applicants.

| Subtest Name | Initial | | Retest | | Mean of Absolute Differences | | |
|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | sd | $\bar{x}$ | sd | $\bar{x}$ | sd | $z_{IR}$ |
| GS | 10.786 | 3.703 | 11.117 | 3.785 | 2.551 | 2.053 | 10.441 |
| AR | 11.353 | 3.826 | 11.911 | 4.214 | 3.020 | 2.438 | 16.383 |
| WK | 17.465 | 5.476 | 17.984 | 5.736 | 3.318 | 2.902 | 10.934 |
| PC | 7.342 | 2.699 | 7.770 | 2.839 | 2.288 | 1.844 | 18.252 |
| NO | 29.334 | 8.848 | 32.271 | 9.322 | 6.092 | 5.612 | 38.178 |
| CS | 36.356 | 13.204 | 42.007 | 13.450 | 9.886 | 9.307 | 50.089 |
| AS | 11.366 | 4.638 | 11.882 | 4.737 | 2.680 | 2.329 | 4.112 |
| MK | 7.989 | 2.950 | 8.325 | 3.037 | 2.569 | 2.120 | 13.258 |
| MC | 10.354 | 3.884 | 11.077 | 4.105 | 2.790 | 2.311 | 19.040 |
| EI | 8.717 | 3.168 | 9.111 | 3.195 | 2.392 | 1.990 | 14.630 |

TABLE 10. Retest Applicants Means and Standard Deviations.

Different Versions of ASVAB (N = 26,137)*

| Subtest Name | Initial | | Retest | | |
|---|---|---|---|---|---|
| | $\bar{x}$ | sd | $\bar{x}$ | sd | z |
| GS | 10.804 | 3.674 | 11.104 | 3.756 | 9.231 |
| AR | 11.371 | 3.788 | 11.902 | 4.162 | 15.254 |
| WK | 17.512 | 5.405 | 17.982 | 5.675 | 9.696 |
| PC | 7.365 | 2.680 | 7.771 | 2.812 | 16.897 |
| NO | 29.407 | 8.784 | 32.321 | 9.286 | 36.856 |
| CS | 36.446 | 13.122 | 42.104 | 13.382 | 48.806 |
| AS | 11.391 | 4.632 | 11.882 | 4.733 | 11.986 |
| MK | 7.991 | 2.919 | 8.313 | 2.999 | 12.439 |
| MC | 10.373 | 3.872 | 11.076 | 4.096 | 20.164 |
| EI | 8.736 | 3.153 | 9.102 | 3.172 | 13.230 |
| AFQT Composite | 51.200 | 10.524 | 54.063 | 11.967 | 29.044 |
| CO Composite | 168.779 | 18.694 | 175.142 | 19.816 | 37.761 |
| EL Composite | 164.499 | 17.152 | 167.237 | 18.373 | 17.611 |

Same Version of ASVAB (N = 1,774)

| Subtest Name | Initial | | Retest | | |
|---|---|---|---|---|---|
| | $\bar{x}$ | sd | $\bar{x}$ | sd | z |
| GS | 10.512 | 4.102 | 11.309 | 4.194 | 5.722 |
| AR | 11.091 | 4.346 | 12.043 | 4.916 | 6.111 |
| WK | 16.776 | 6.397 | 18.015 | 6.584 | 5.685 |
| PC | 6.994 | 2.951 | 7.759 | 3.165 | 7.446 |
| NO | 28.267 | 9.686 | 31.532 | 9.812 | 9.974 |
| CS | 35.032 | 14.288 | 40.567 | 14.338 | 11.517 |
| AS | 10.997 | 4.710 | 11.890 | 4.804 | 5.591 |
| MK | 7.962 | 3.371 | 8.499 | 3.540 | 4.627 |
| MC | 10.083 | 4.048 | 11.090 | 4.237 | 7.238 |
| EI | 8.433 | 3.360 | 9.238 | 3.509 | 6.979 |
| AFQT Composite | 49.246 | 13.920 | 53.836 | 14.787 | 9.520 |
| CO Composite | 166.271 | 21.713 | 174.421 | 22.485 | 10.933 |
| EL Composite | 162.742 | 21.038 | 168.427 | 22.514 | 7.771 |

*3,008 took same non-AFQT portion of the ASVAB

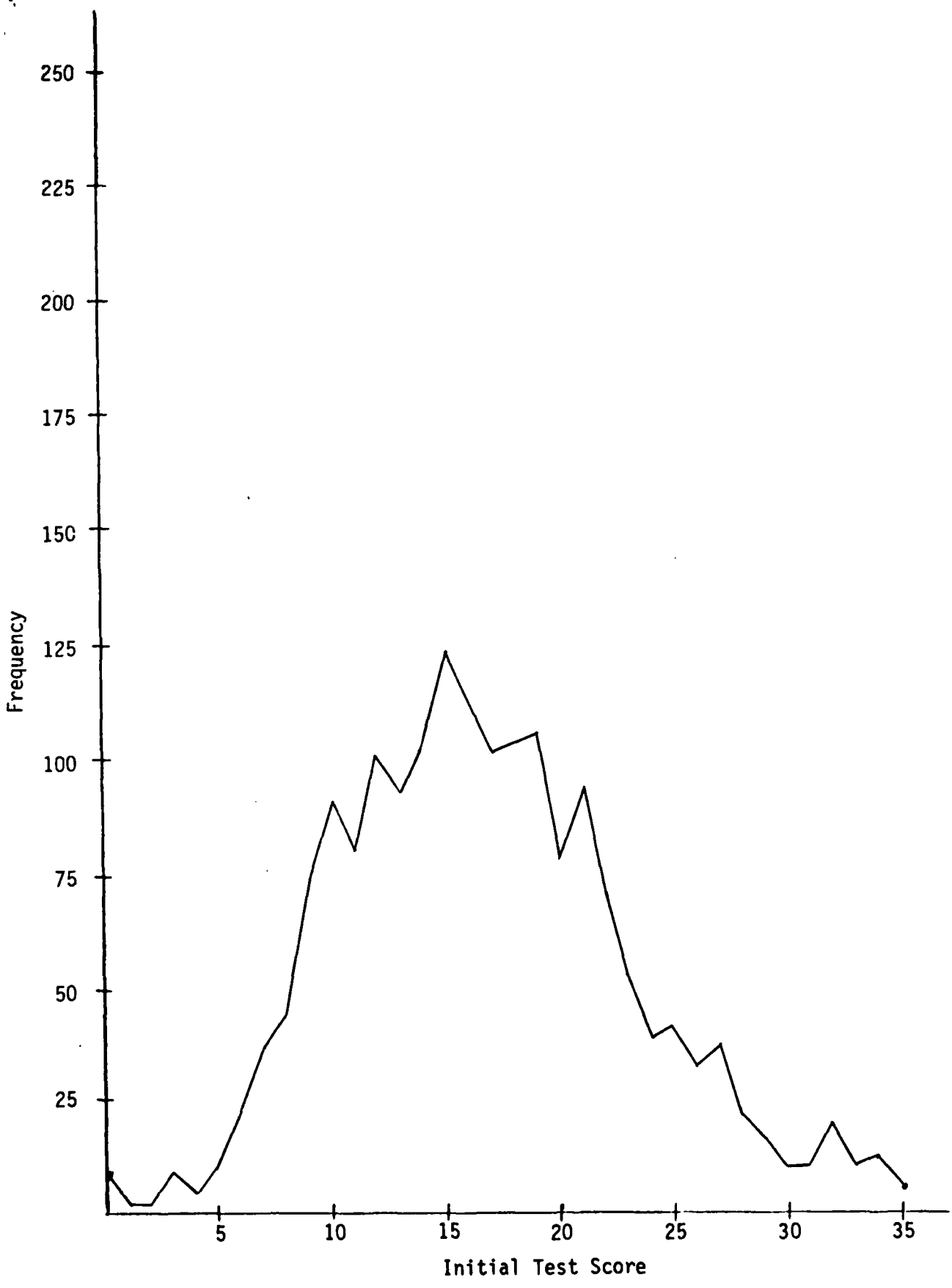



Figure 1. Frequency of Word Knowledge Subtest, retest population, same version of ASVAB (N = 1,774).

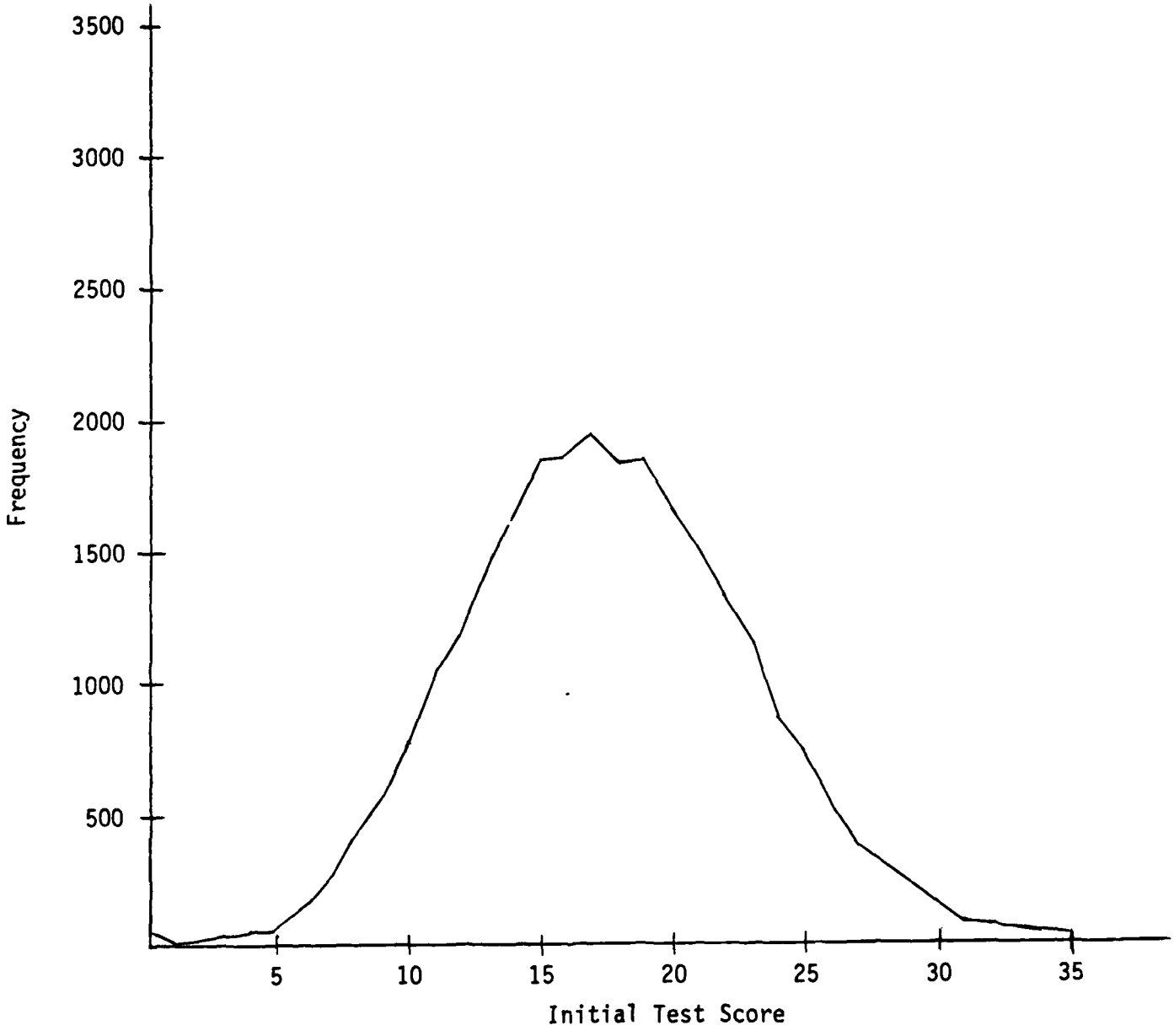



Figure 2. Frequency of Word Knowledge Subtest, retest population, different versions of ASVAB (N = 26,136)

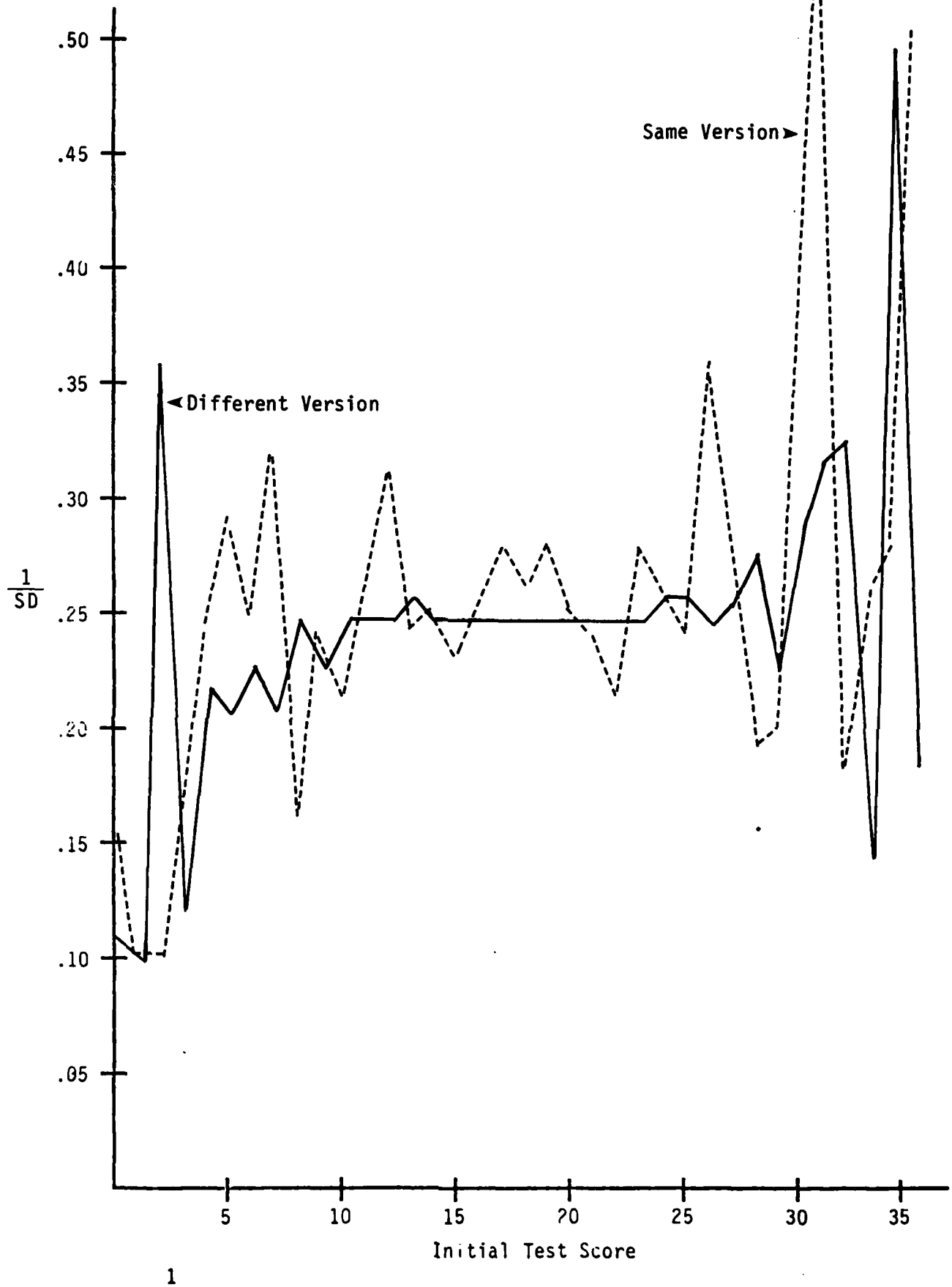



Figure 3. $\frac{1}{SD}$, Word Knowledge Subtest, retest population same and different versions of ASVAB (N = 1,774)

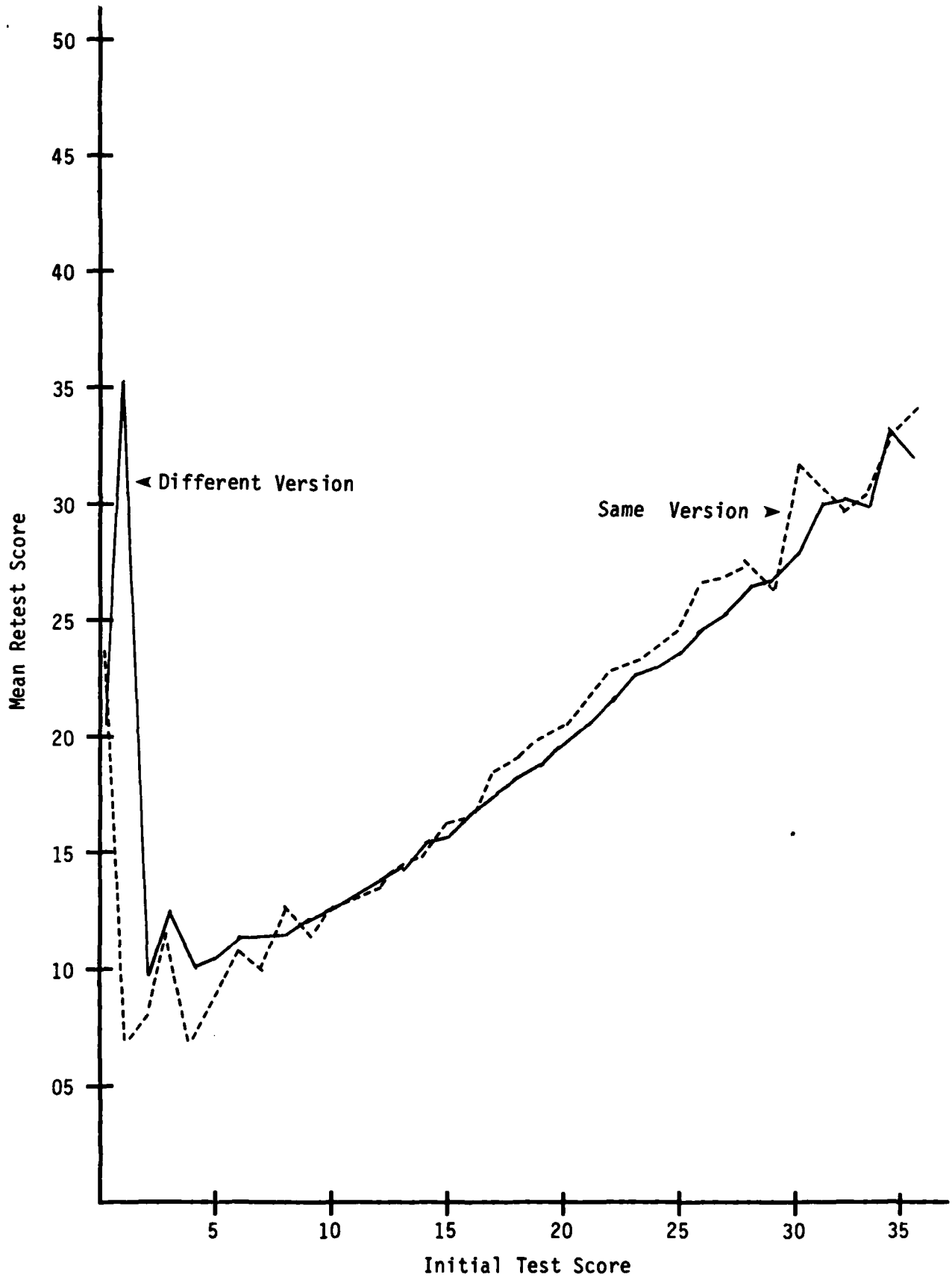



Figure 4. Mean retest score, Word Knowledge Subtest, retest population same and different versions of ASVAB (N = 26,136)

As can be seen from Table 9, there is a significant increase in the mean subtest scores between the initial and retest administration. This increase might be attributed to the practice effects of test taking. Indeed the largest increases in mean scores were found to be in the two speeded subtests.

A comparison of the retest applicants' mean scores was made with the initial test only applicants' mean scores for each subtest to examine the differences which reflect actual numbers of items that were answered correctly. The mean scores for the last previous and most recent tests for the retest applicants and the initial test only applicants were converted to percent correct for each subtest (see Table 11). The difference in percent correct for initial test only applicants and retest applicants' scores was computed for each subtest. The difference was multiplied by the number of items in each subtest to generate an index of the approximate difference in actual number of items answered correctly by the initial only applicants as compared to the retested applicants.

The two power tests which showed the greatest difference in the index were AR and WK. There were no differences in this index for the two speeded subtests; however, when the same computation was made for these two tests using percent values it was found that a difference of four and six items were answered correctly for NO and CS, respectively. This result tends to support the notion that practice effects were influencing the scores of these two subtests.

Whereas, the previous comparisons were made to examine the effects of scoring differences on shifts between AFQT categories, the data in Table 12 presents shifts made in AFQT categories by virtue of retests taken by this group of applicants. As with previous results, where the average mean scores were higher for the most recent testing than for the last previous testing, the table shows in numbers the persons who changed from a lower AFQT category to a higher one. Although the number who shift appears to be large, particularly in the lower scoring categories, this shift is expected due to the construction of the AFQT. Table 13 shows similar results for the Army CO Composite. The shift into a higher category is reflected in the nature of the structure of the subtests which comprise this component. Shifts to higher categories are easier to achieve for lower scoring applicants because the category intervals are relatively short. Thus, an increase in one's speediness on the CS subtest alone could be sufficient to move the applicant easily at least one category.

Table 14 shows the shifts which occurred between categories for the EL composite, a composite which contains no speeded subtests. As can be seen from this table, far fewer category shifts occur between the initial and speeded subtests.

The scoring shifts in percents for the AFQT, CO and EL composites are presented in Tables 15, 16 and 17. As can be seen from these tables, AFQT is the most stable of the composites.

TABLE 11. Comparison of Average Percent Correct Responses and Standard Scores of ASVAB Subtest Items for Initial and Retest Testing Army Applicants and All Army Applicants With Scored Matched Tests From Contractor.

| | | Retested Applicants (N = 27,911) | | | | | All Matched Army Applicants (N = 143,279) | Approximate Number Of Items Different | Approximate Number Of Items Different |
|---|---|---|---|---|---|---|---|---|---|
| Subtest Name | Number of Items in Subtest (1) | Std. Score | Initial Percent Correct (2) | Std. Score | Retest Percent Correct (3) | Std. Score | Percent Correct (4) | (4-3)*1 (5) | (4-2)*1 (6) |
| GS | 25 | 40 | 43.2 | 40 | 44.4 | 46 | 55.6 | 3 | 3 |
| AR | 30 | 41 | 37.9 | 42 | 39.7 | 48 | 53.2 | 4 | 5 |
| WK | 35 | 39 | 50.0 | 40 | 51.4 | 46 | 64.1 | 5 | 5 |
| PC | 15 | 40 | 49.1 | 43 | 51.8 | 46 | 62.5 | 2 | 2 |
| NO | 50 | 44 | 58.8 | 47 | 64.6 | 48 | 66.9 | 1 | 4 |
| CS | 84 | 46 | 43.4 | 49 | 50.1 | 49 | 50.0 | 0 | 6 |
| AS | 25 | 41 | 45.6 | 43 | 47.5 | 46 | 57.9 | 3 | 3 |
| MK | 25 | 43 | 32.0 | 44 | 33.3 | 48 | 43.8 | 3 | 3 |
| MC | 25 | 40 | 41.5 | 42 | 44.3 | 46 | 53.2 | 2 | 3 |
| EI | 20 | 42 | 43.7 | 42 | 46.5 | 47 | 54.8 | 2 | 2 |
| Total Difference | | | | | | | | 25 | 36 |

TABLE 12. Frequency of Initial and Retest Scores FY 1981 Army Applicants by AFQT Mental Category.*

| Retest Scores AFQT Mental Category | Initial Test Scores AFQT Mental Category | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | II | IIIA | IIIB | IVA | IVB | IVC | V | |
| | 101-105 | 84-100 | 76-83 | 65-75 | 56-64 | 49-55 | 38-48 | 0-37 | Total |
| I | 8 | 12 | 0 | 3 | 1 | 0 | 0 | 4 | 28 |
| II | 4 | 127 | 55 | 19 | 24 | 7 | 13 | 17 | 266 |
| IIIA | 0 | 35 | 63 | 157 | 277 | 24 | 23 | 18 | 597 |
| IIIB | 0 | 14 | 54 | 574 | 3,079 | 579 | 191 | 49 | 4,558 |
| IVA | 1 | 6 | 8 | 179 | 3,497 | 2,210 | 1,248 | 77 | 7,226 |
| IVB | 0 | 1 | 3 | 31 | 1,275 | 2,247 | 2,632 | 169 | 6,358 |
| IVC | 0 | 2 | 3 | 10 | 337 | 1,297 | 3,964 | 880 | 6,493 |
| V | 0 | 2 | 0 | 4 | 54 | 123 | 983 | 1,219 | 2,385 |
| Total | 13 | 199 | 186 | 977 | 8,562 | 6,487 | 9,054 | 2,433 | 27,911 |
| % of Total | .1 | .7 | .7 | 3.5 | 30.7 | 23.2 | 32.4 | 8.7 | 100.0 |

*AFQT = AR + WK + PC + 1/2NO

TABLE 13. Frequency of Initial and Retest Scores FY 1981 Army Applicants for Army CO Composite.*

| Retest Score | Initial Score | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 | Total |
| 120+ | 44 | 46 | 5 | 9 | 3 | 4 | 0 | 0 | 15 | 126 |
| 110-119 | 12 | 77 | 68 | 145 | 71 | 40 | 26 | 10 | 28 | 477 |
| 105-109 | 1 | 34 | 58 | 167 | 156 | 92 | 43 | 12 | 24 | 587 |
| 100-104 | 1 | 19 | 61 | 308 | 411 | 367 | 224 | 101 | 112 | 1,604 |
| 95-99 | 1 | 10 | 28 | 161 | 368 | 474 | 473 | 278 | 297 | 2,090 |
| 90-94 | 0 | 3 | 5 | 67 | 271 | 516 | 681 | 617 | 786 | 2,946 |
| 85-89 | 0 | 2 | 2 | 31 | 103 | 383 | 707 | 948 | 1,851 | 4,027 |
| 80-84 | 1 | 2 | 1 | 7 | 31 | 171 | 465 | 815 | 2,607 | 4,100 |
| 40-79 | 6 | 2 | 5 | 10 | 35 | 118 | 385 | 995 | 10,397 | 11,953 |
| Total | 66 | 195 | 233 | 905 | 1,449 | 2,165 | 3,005 | 3,776 | 16,117 | 27,911 |
| % of Total | .2 | .7 | .8 | 3.2 | 5.2 | 7.8 | 10.8 | 13.5 | 57.8 | 100.0 |

*CO = AR + AS + MC + CS

TABLE 14. Frequency of Initial and Retest Scores FY 1981 Army Applicants for EL Composite.*

| Retest Score | Initial Score | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 | Total |
| 120+ | 47 | 19 | 5 | 4 | 1 | 1 | 2 | 3 | 6 | 88 |
| 110-119 | 13 | 72 | 40 | 39 | 17 | 11 | 2 | 7 | 24 | 226 |
| 105-109 | 0 | 20 | 49 | 81 | 73 | 44 | 15 | 12 | 27 | 321 |
| 100-104 | 3 | 5 | 40 | 186 | 234 | 239 | 77 | 47 | 56 | 887 |
| 95-99 | 1 | 8 | 23 | 125 | 265 | 404 | 270 | 195 | 159 | 1,450 |
| 90-94 | 1 | 2 | 8 | 94 | 258 | 589 | 657 | 597 | 552 | 2,758 |
| 85-89 | 1 | 2 | 4 | 16 | 106 | 412 | 649 | 792 | 1,302 | 3,284 |
| 80-84 | 2 | 2 | 1 | 8 | 54 | 283 | 500 | 853 | 2,151 | 3,855 |
| 40-79 | 3 | 1 | 4 | 6 | 39 | 198 | 599 | 1,583 | 12,609 | 15,042 |
| Total | 71 | 132 | 174 | 559 | 1,047 | 2,181 | 2,771 | 4,089 | 16,886 | 27,911 |
| % of Total | .2 | .5 | .6 | 2.0 | 3.8 | 7.8 | 9.9 | 14.7 | 60.5 | 100.0 |

*EL = GS + AR + MK + EI

TABLE 15. Scoring Shifts in Percents for AFQT Composite From Initial to Retest: FY 1981 Army Applicants.*

| Retest AFQT Mental Category | Initial Test AFQT Mental Category | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | V | IVB | IVA | IIIC | IIIB | IIIA | II | I |
| I | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 62 |
| II | 1 | 0 | 0 | 0 | 2 | 30 | 64 | 31 |
| IIIA | 1 | 0 | 0 | 3 | 16 | 34 | 18 | 0 |
| IIIB | 2 | 2 | 9 | 36 | 59 | 29 | 7 | 0 |
| IIIC | 3 | 14 | 34 | 41 | 18 | 4 | 3 | 8 |
| IVA | 7 | 29 | 35 | 15 | 3 | 2 | 1 | 0 |
| IVB | 36 | 44 | 20 | 4 | 1 | 2 | 1 | 0 |
| V | 50 | 11 | 2 | 1 | 0 | 0 | 1 | 0 |
| % of Total** | 9 | 32 | 23 | 31 | 4 | 1 | 1 | 0 |

*AFQT = AR + WK + PC + 1/2NO

**May not total 100 due to rounding

TABLE 16. Scoring Shifts in Percents for CO Composite from Initial to Retest: FY 1981 Army Applicants.*

| Retest Score | Initial Test Score | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 |
| 120+ | 67 | 24 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 110-119 | 18 | 39 | 29 | 16 | 5 | 2 | 1 | 0 | 0 |
| 105-109 | 2 | 17 | 25 | 18 | 11 | 4 | 1 | 0 | 0 |
| 100-104 | 2 | 10 | 26 | 34 | 28 | 17 | 7 | 3 | 1 |
| 95-99 | 2 | 5 | 12 | 18 | 25 | 22 | 16 | 7 | 2 |
| 90-94 | 0 | 2 | 2 | 7 | 19 | 24 | 23 | 16 | 5 |
| 85-89 | 0 | 1 | 1 | 3 | 7 | 18 | 24 | 25 | 11 |
| 80-84 | 2 | 1 | 0 | 8 | 2 | 8 | 15 | 22 | 16 |
| 40-79 | 9 | 1 | 2 | 1 | 2 | 5 | 13 | 26 | 65 |
| % of Total** | 0 | 1 | 1 | 3 | 5 | 8 | 11 | 14 | 58 |

*CO = AR + AS + MC + CS

**May not total 100 due to rounding

TABLE 17. Scoring Shifts in Percents for EL Composite from Initial to Retest: FY 1981 Army Applicants.*

| Retest Score | Initial Test Score | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 120+ | 110-119 | 105-109 | 100-104 | 95-99 | 90-94 | 85-89 | 80-84 | 40-79 |
| 120+ | 66 | 14 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| 110-119 | 18 | 55 | 23 | 7 | 2 | 1 | 0 | 0 | 0 |
| 105-109 | 0 | 15 | 28 | 14 | 7 | 2 | 1 | 0 | 0 |
| 100-104 | 4 | 4 | 23 | 33 | 22 | 11 | 3 | 1 | 0 |
| 95-99 | 1 | 6 | 13 | 22 | 25 | 19 | 10 | 5 | 1 |
| 90-94 | 1 | 2 | 5 | 17 | 25 | 27 | 24 | 15 | 3 |
| 85-89 | 1 | 2 | 2 | 3 | 10 | 19 | 23 | 19 | 8 |
| 80-84 | 3 | 2 | 1 | 1 | 5 | 13 | 18 | 21 | 13 |
| 40-79 | 4 | 1 | 2 | 1 | 4 | 9 | 22 | 39 | 75 |
| % of Total** | 0 | 0 | 1 | 2 | 4 | 8 | 10 | 15 | 61 |

*EL = GS + AR + MK + EI

**May not total 100 due to rounding

## DISCUSSION

The impact of this practice effect must be considered in light of the potential for marginally-qualified individuals to become eligible for enlistment in the Armed Services. The capability of an individual to change his or her qualifying score by increasing the speed at which the NO questions are answered have both positive and negative implications. On the one hand, it might be a positive indication that the individual has a willingness and capability to learn repetitive tasks. On the other hand, it might be an indication that the individual has only limited skills, such as the ability to acquire speed in performing simple computations. Indeed, a close examination of the retest means and standard deviations shows not only an increase in the average subtest scores, but a comparable increase in the spread of the scores. Thus, the gain achieved in the speeded test scores may be offset by the loss of points in the power tests.

## GENERAL DISCUSSION AND RECOMMENDATIONS

The two major purposes of this project were to examine the reliability of the ASVAB data reported by the MEPS; and to examine the relationships between the scores reported for Army applicants who took the ASVAB on more than one occasion. Comparisons were made of ASVAB subtest scores reported by Army applicants from a pool of individuals who applied for military service during fiscal year 1981. In addition, test-retest scores were compared for approximately 30,000 applicants.

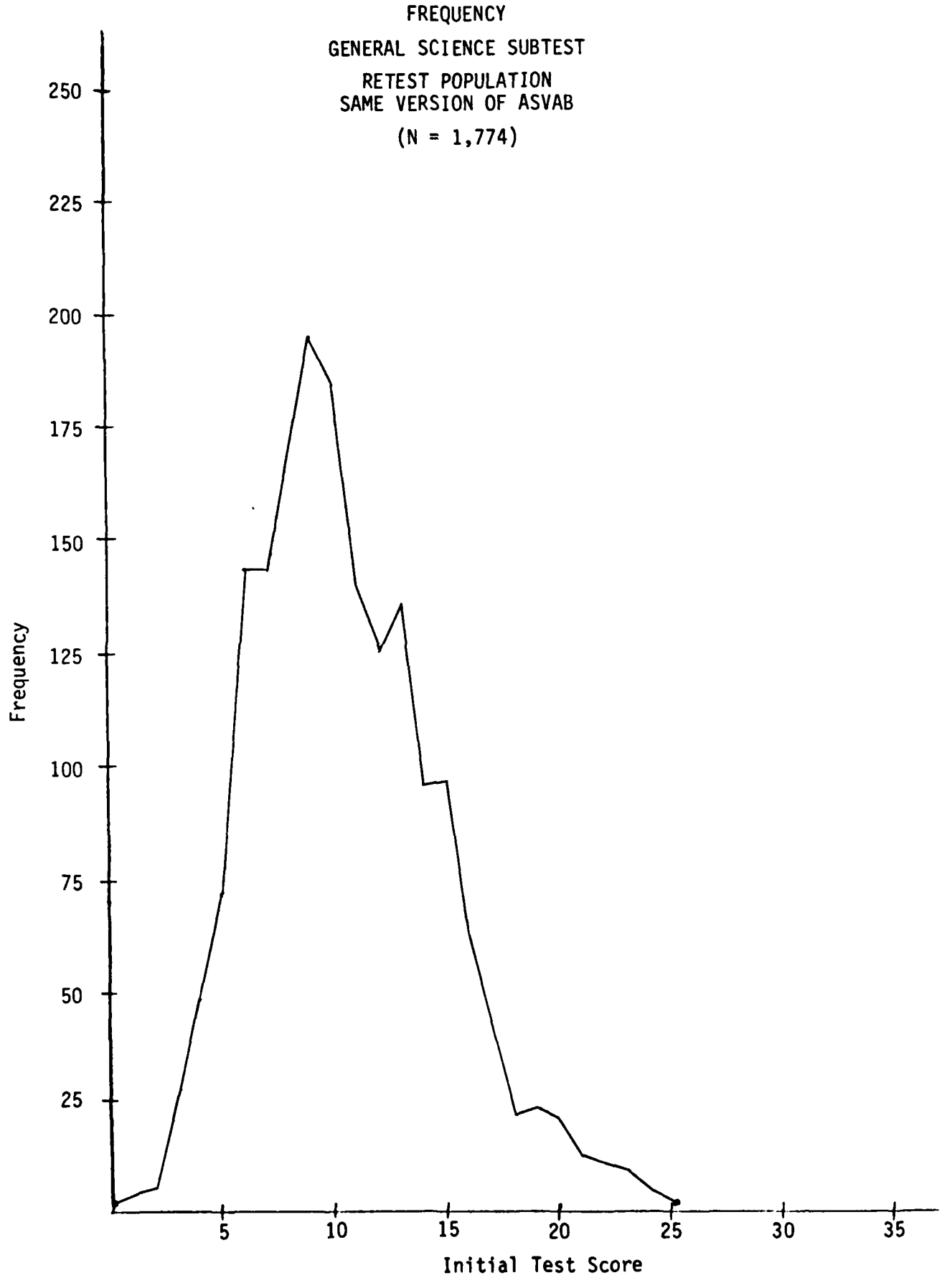
The MEPS reported scores were found to be highly reliable with the exception of those for the CS subtest. This result is consistent with other similar research conducted by the ARI. It is recommended that both factors be more closely examined to determine if remedial steps are required to achieve more accurate scores on this subtest.

The analyses of the test-retest data for applicants revealed the potential impact of practice effects on increasing scores for speeded subtests of the ASVAB. A recommended solution to this problem is the introduction of a practice test prior to the administration of the initial battery so as to minimize the potential for large differences in the test-retest scores which may be attributable to such an effect.

Finally, an assessment of the scoring error rate using the AFQT and Army Combat Composite resulted in small percentages for both composites. Nevertheless, it is recommended that these data be examined more closely to determine the effects of errors in scoring the various subtests, using more robust techniques, such as polynomial models to determine the effects of the error by individual subtests and processing stations.

# APPENDIX A

## FREQUENCIES FOR ASVAB SUBTESTS: RETESTED APPLICANT POOL

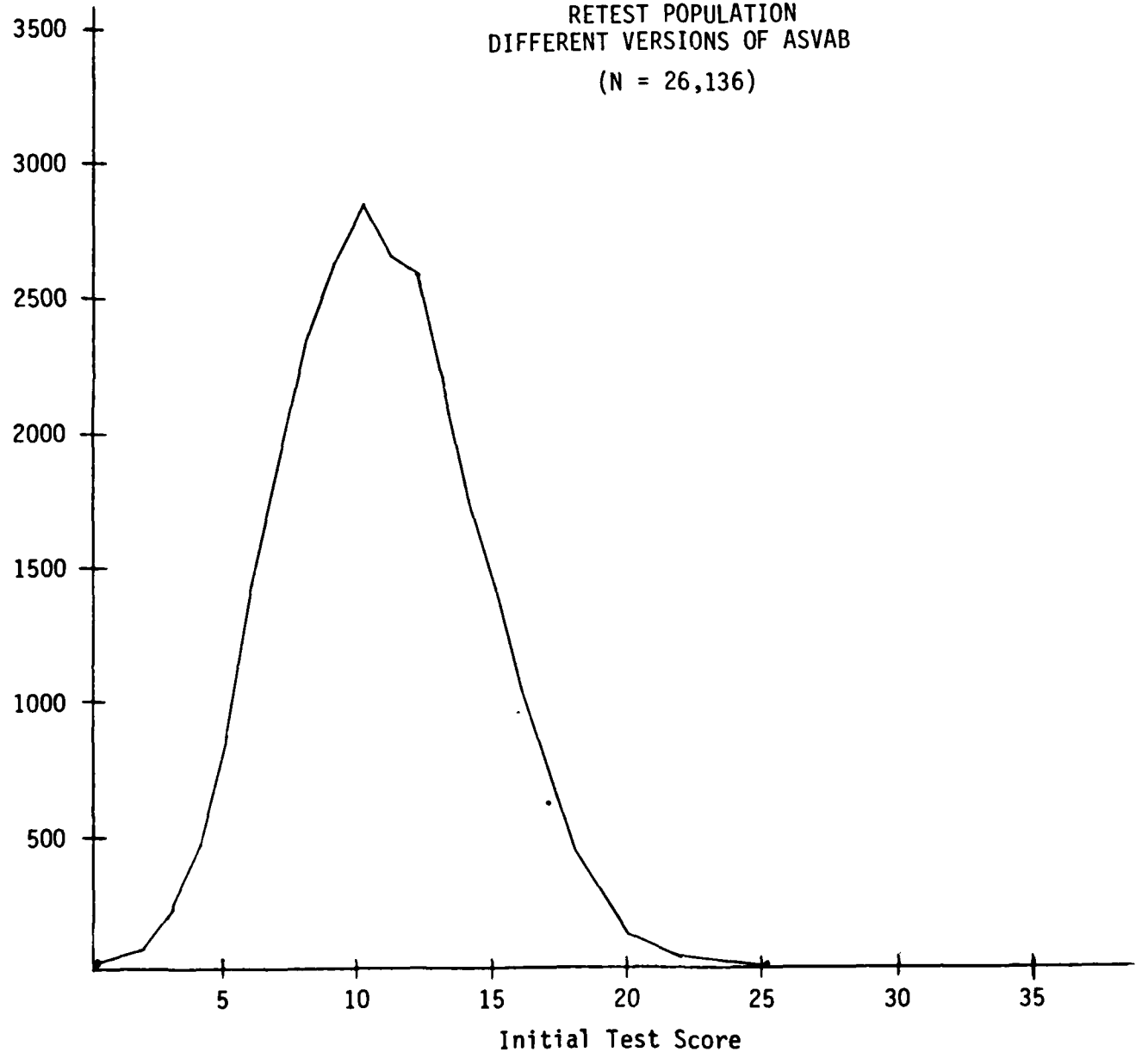

FREQUENCY
GENERAL SCIENCE SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
Frequency
250
225
200
175
150
125
100
75
50
25
5
10
15
20
25
30
35
Initial Test Score

FREQUENCY

GENERAL SCIENCE SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

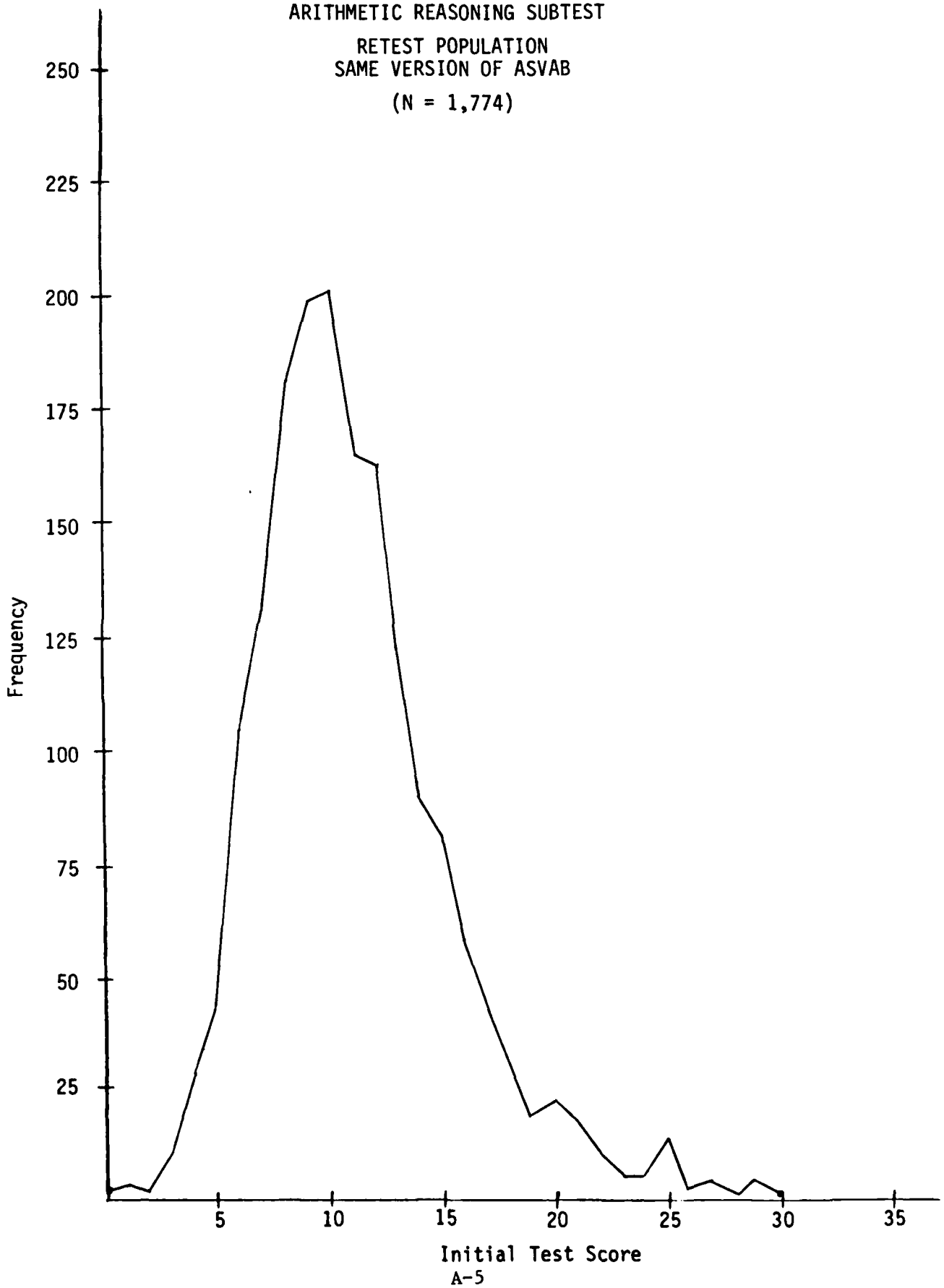


FREQUENCY

ARITHMETIC REASONING SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

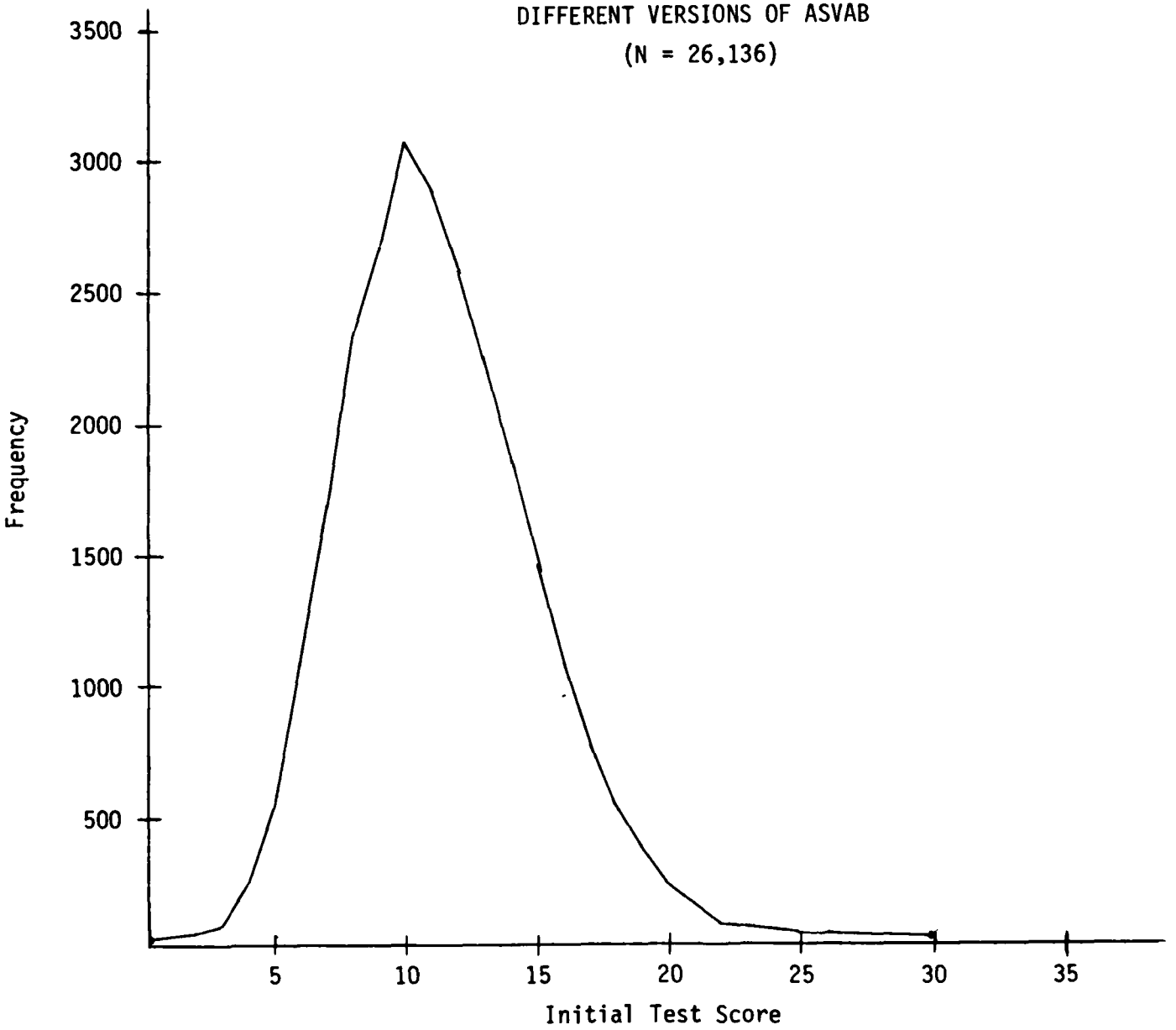


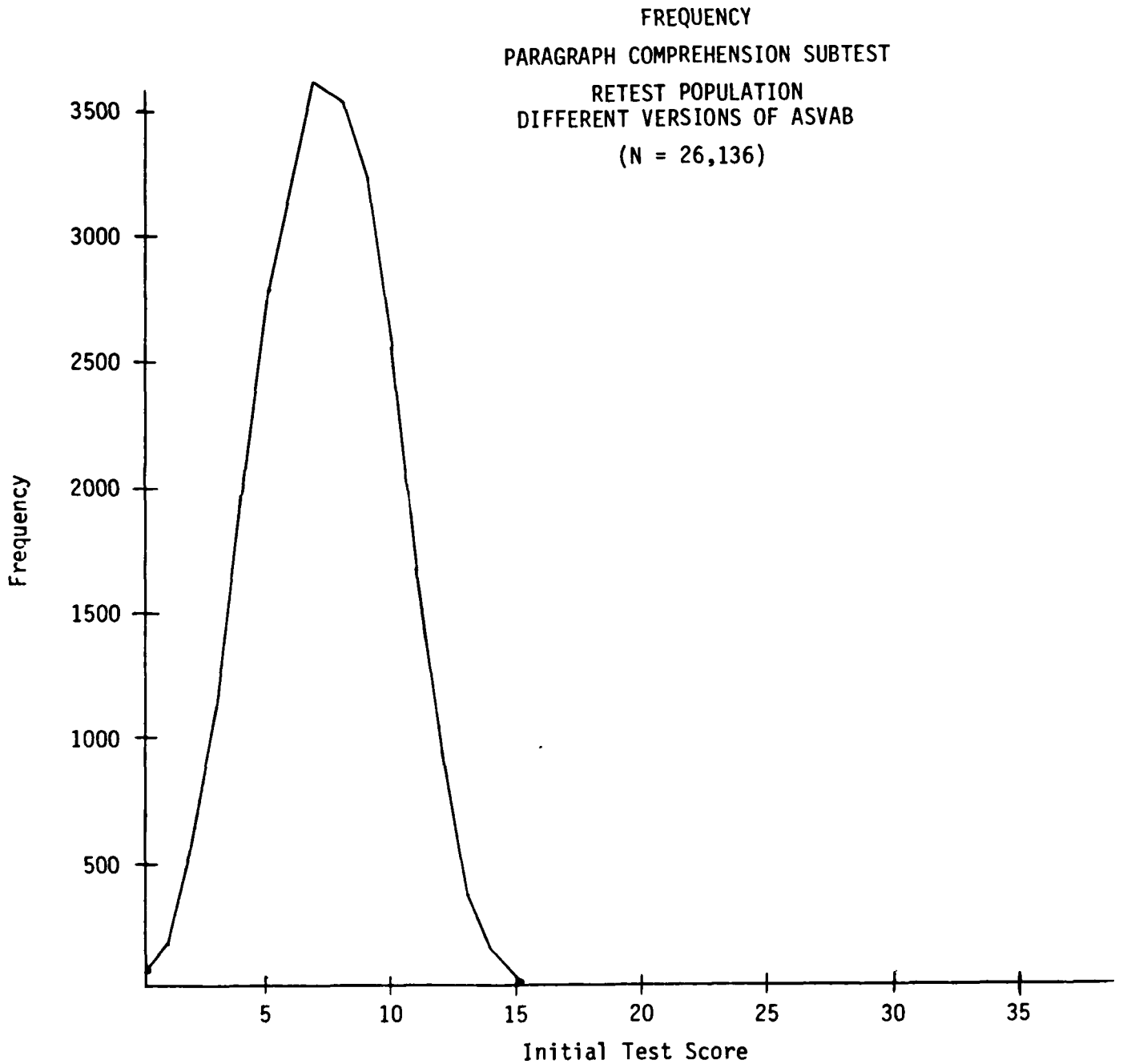
FREQUENCY

ARITHMETIC REASONING SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)



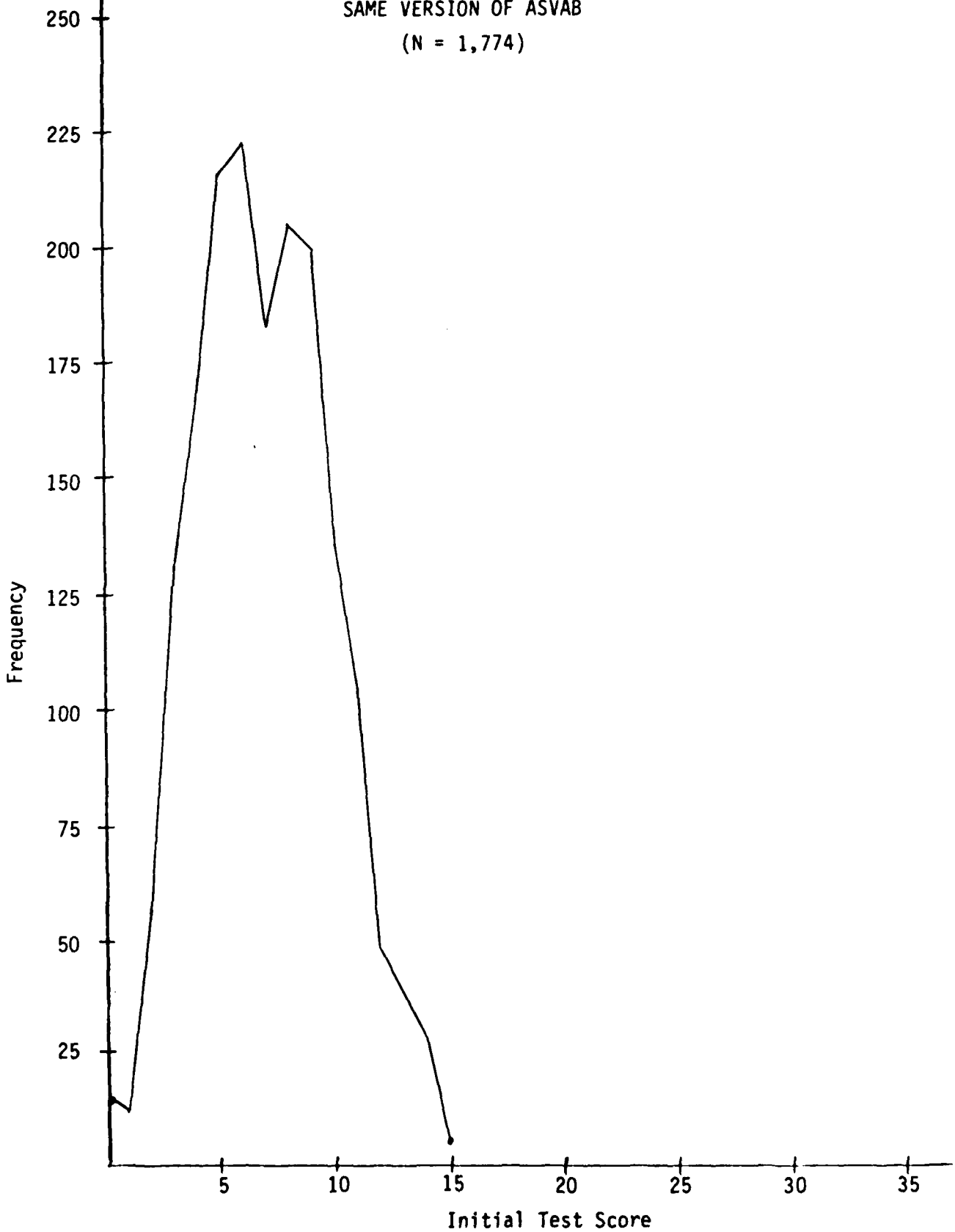

FREQUENCY
PARAGRAPH COMPREHENSION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Frequency
3500
3000
2500
2000
1500
1000
500
5
10
15
20
25
30
35
Initial Test Score

FREQUENCY

PARAGRAPH COMPREHENSION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

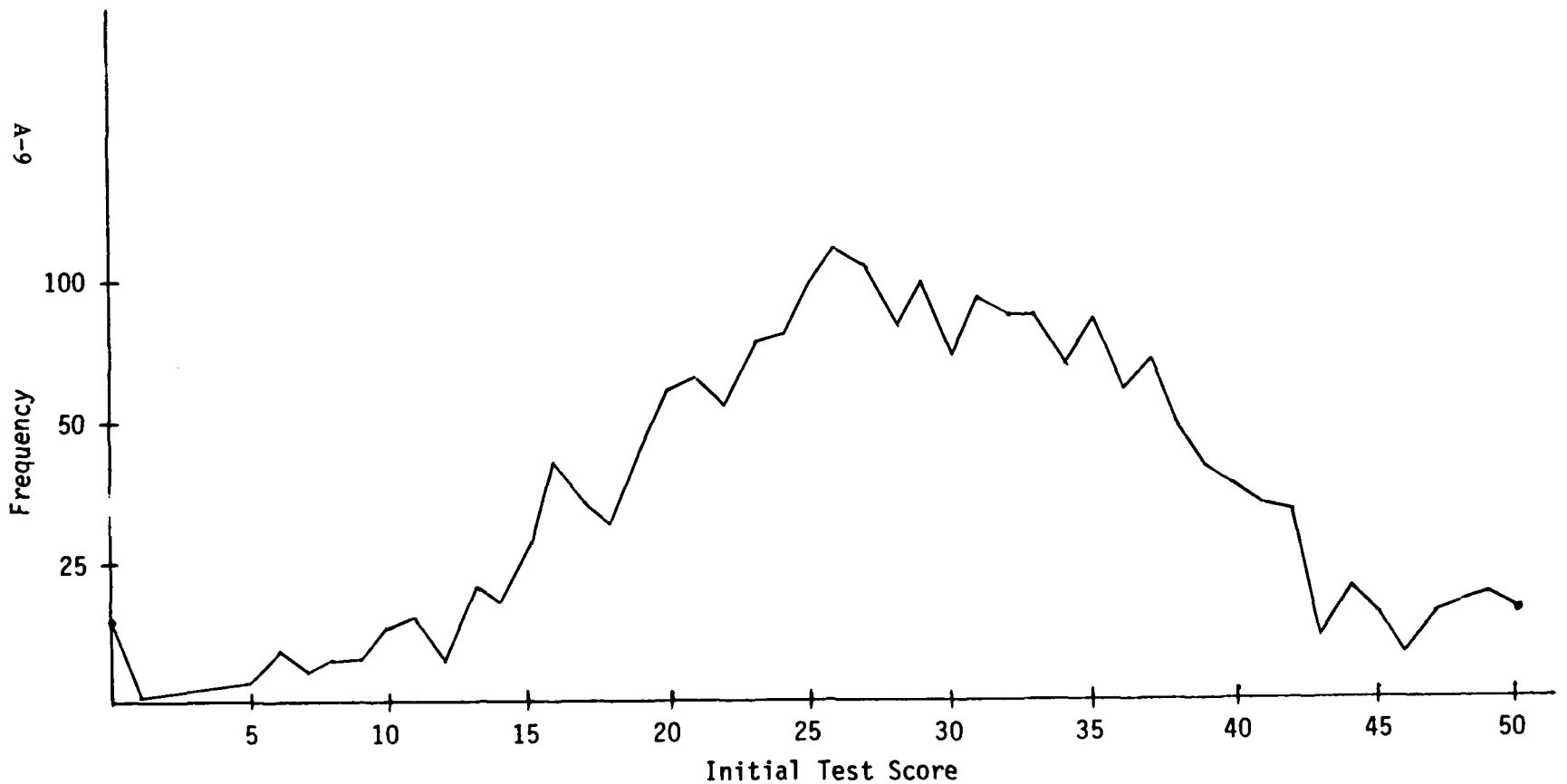


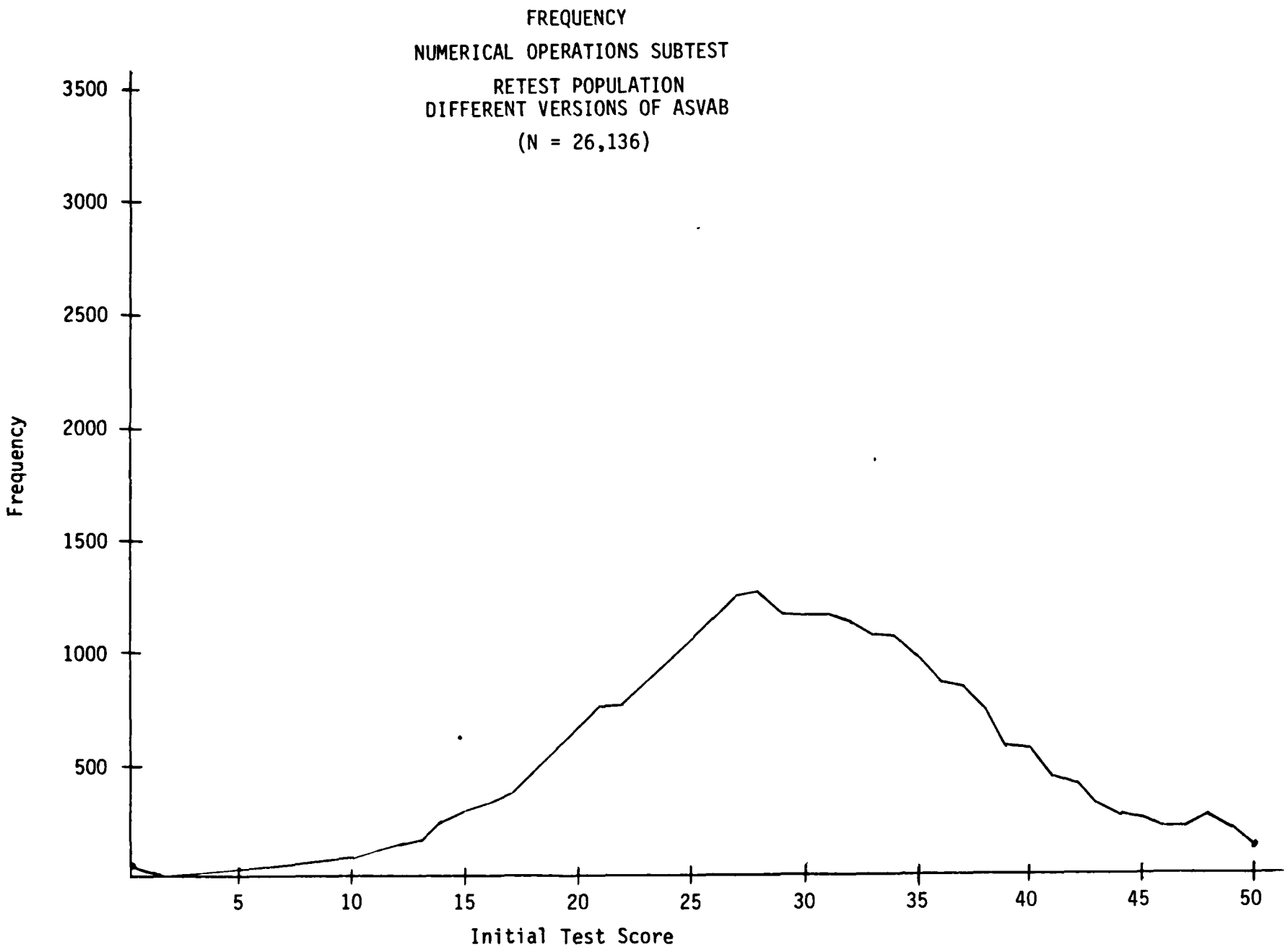
FREQUENCY

NUMERICAL OPERATIONS SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)



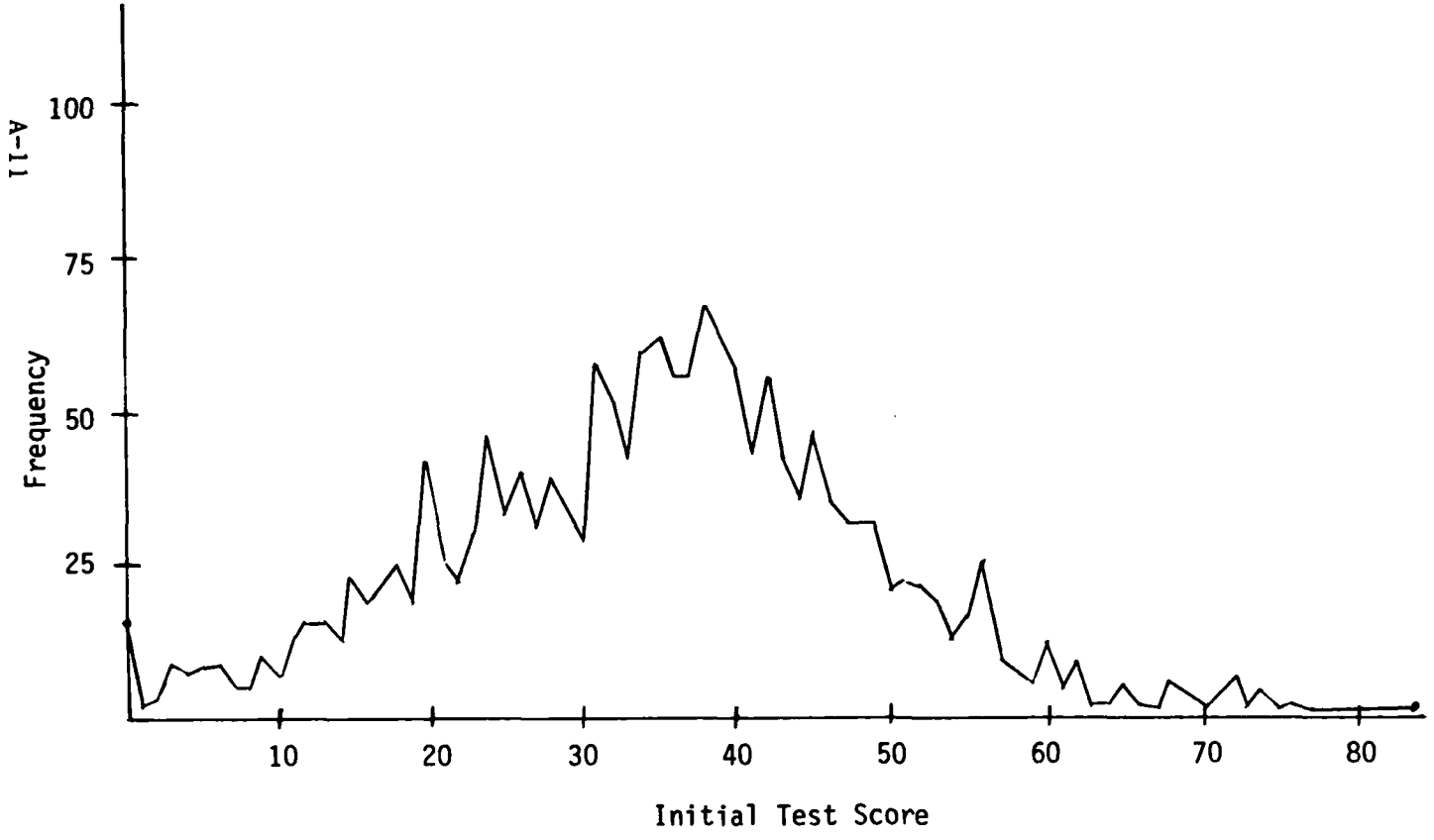

FREQUENCY
NUMERICAL OPERATIONS SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Frequency
3500
3000
2500
2000
1500
1000
500
5
10
15
20
25
30
35
40
45
50
Initial Test Score

FREQUENCY

CODING SPEED SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

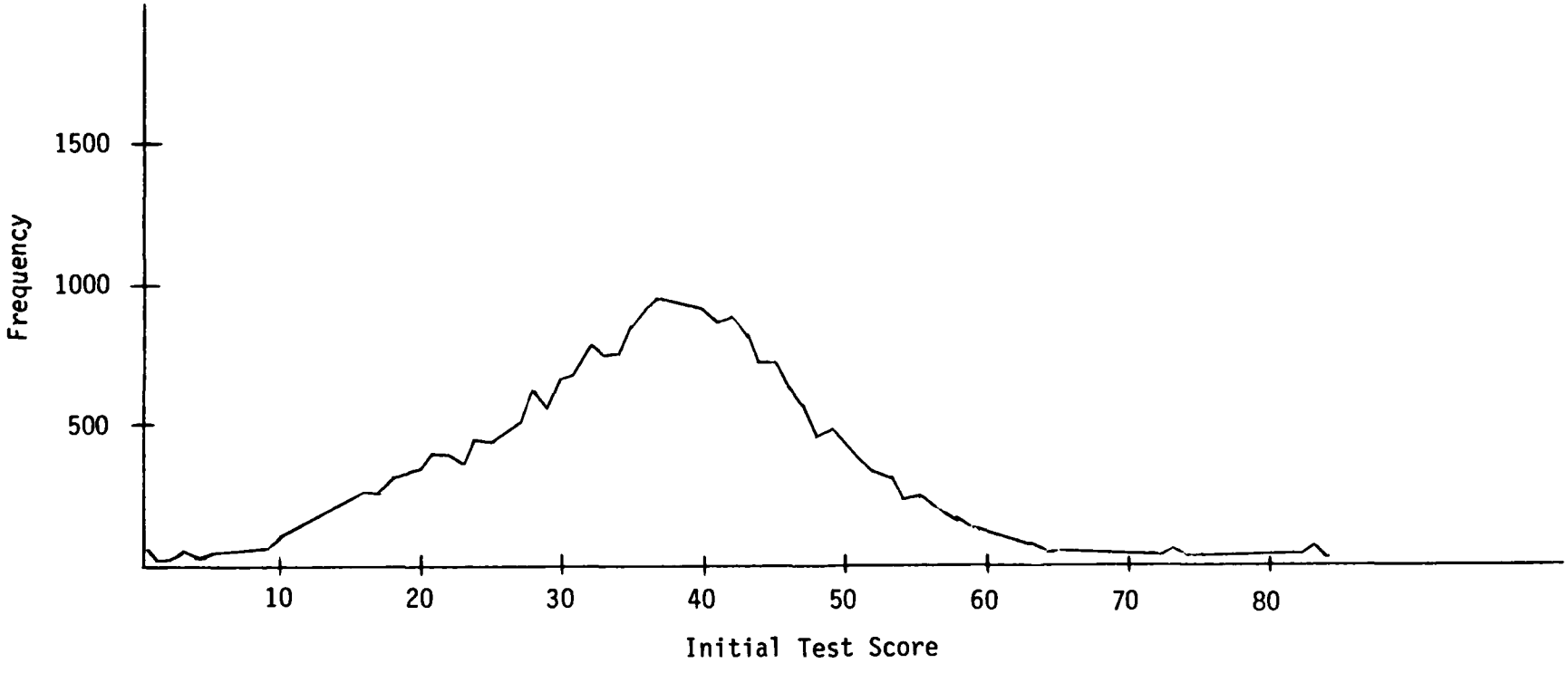


FREQUENCY

CODING SPEED SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

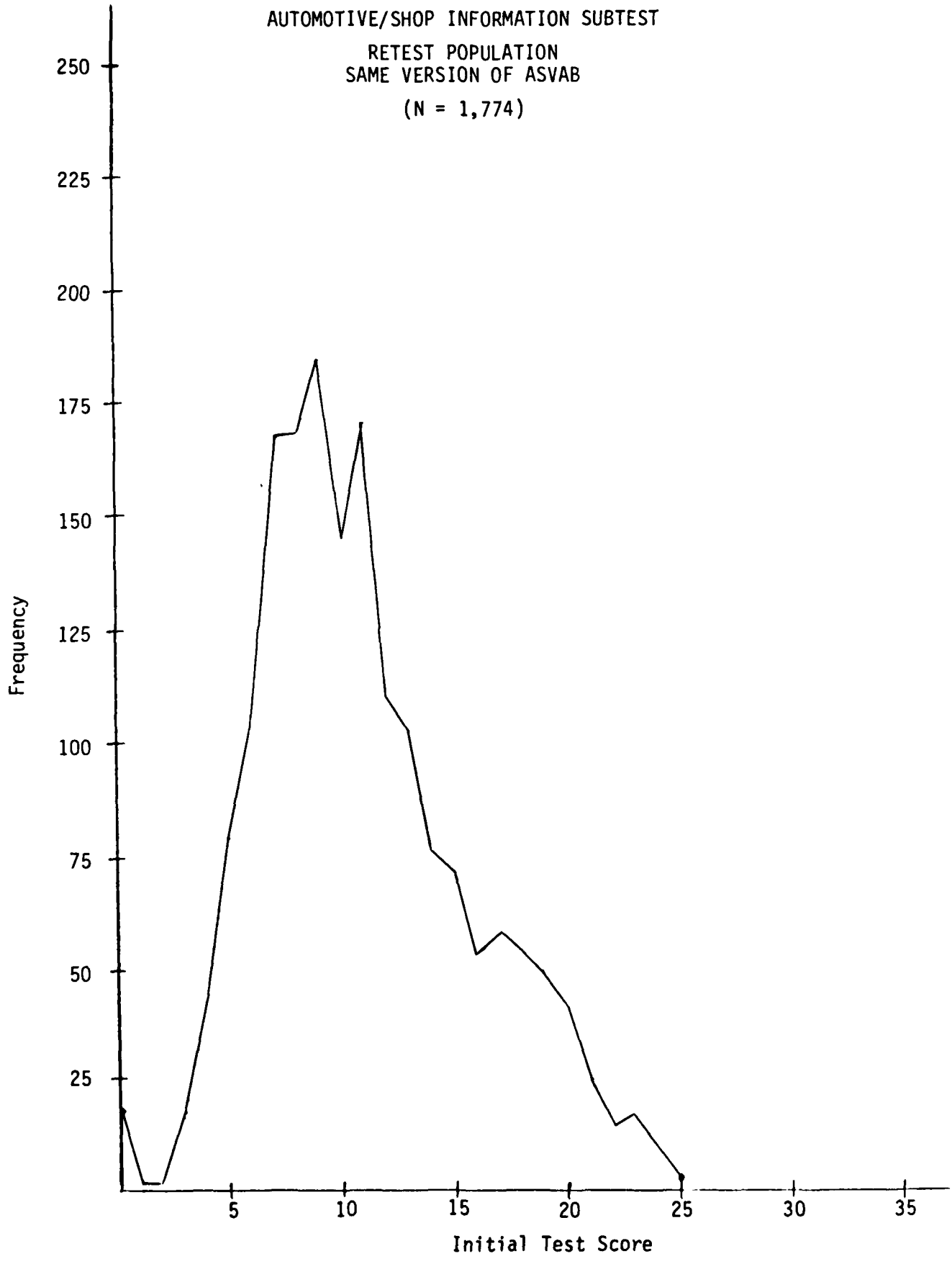


FREQUENCY

AUTOMOTIVE/SHOP INFORMATION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

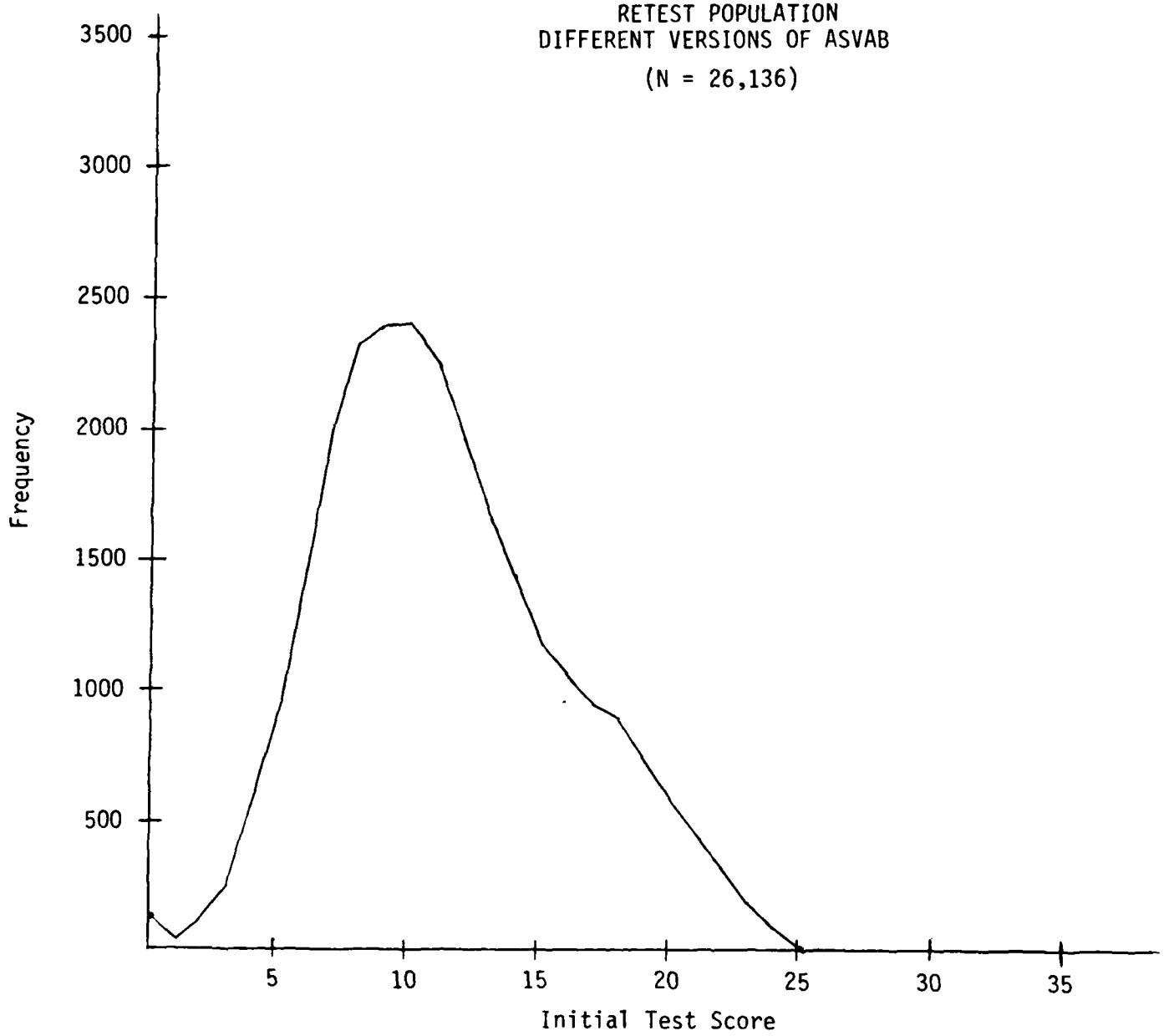


FREQUENCY

AUTOMOTIVE/SHOP INFORMATION SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

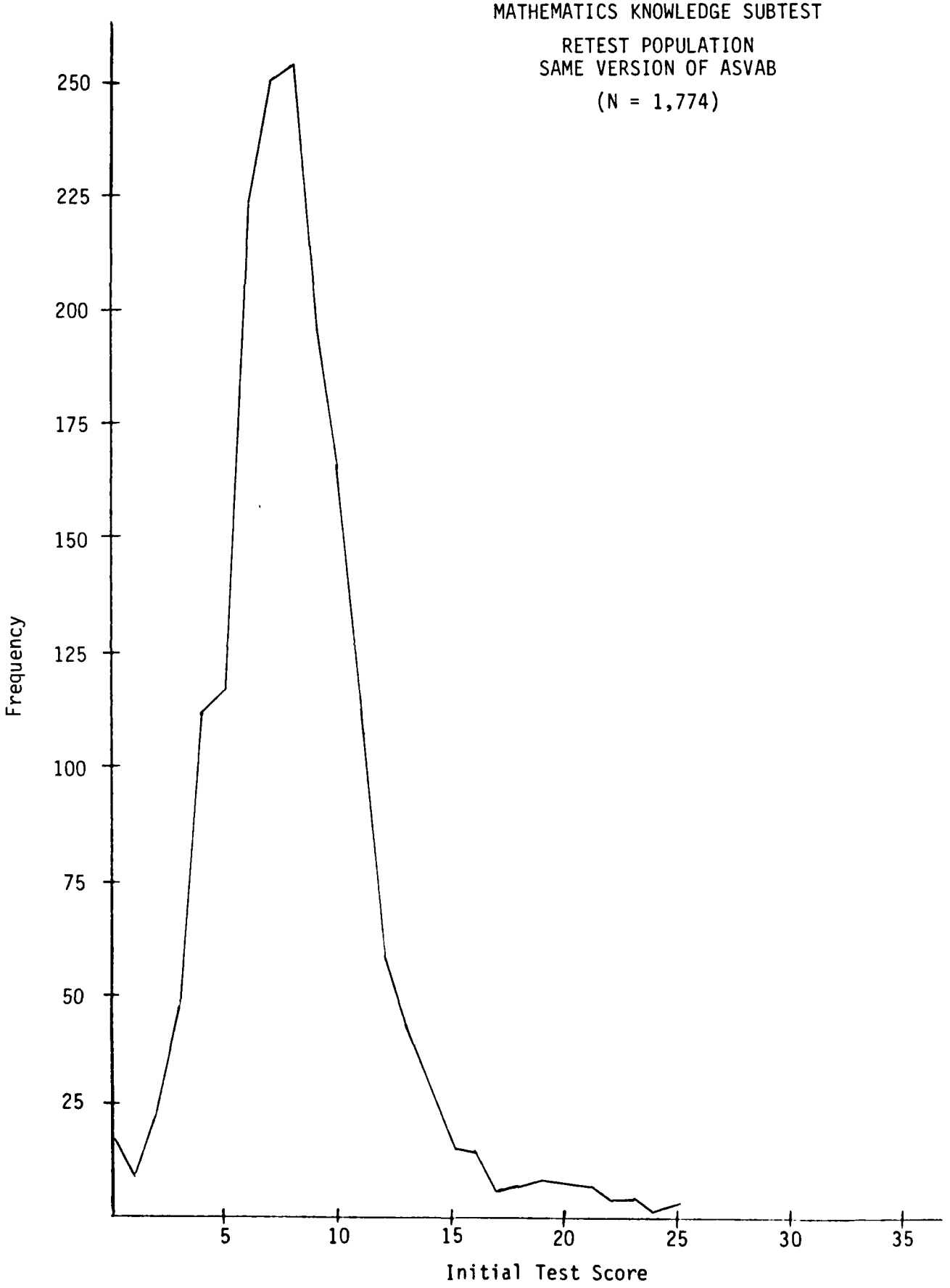


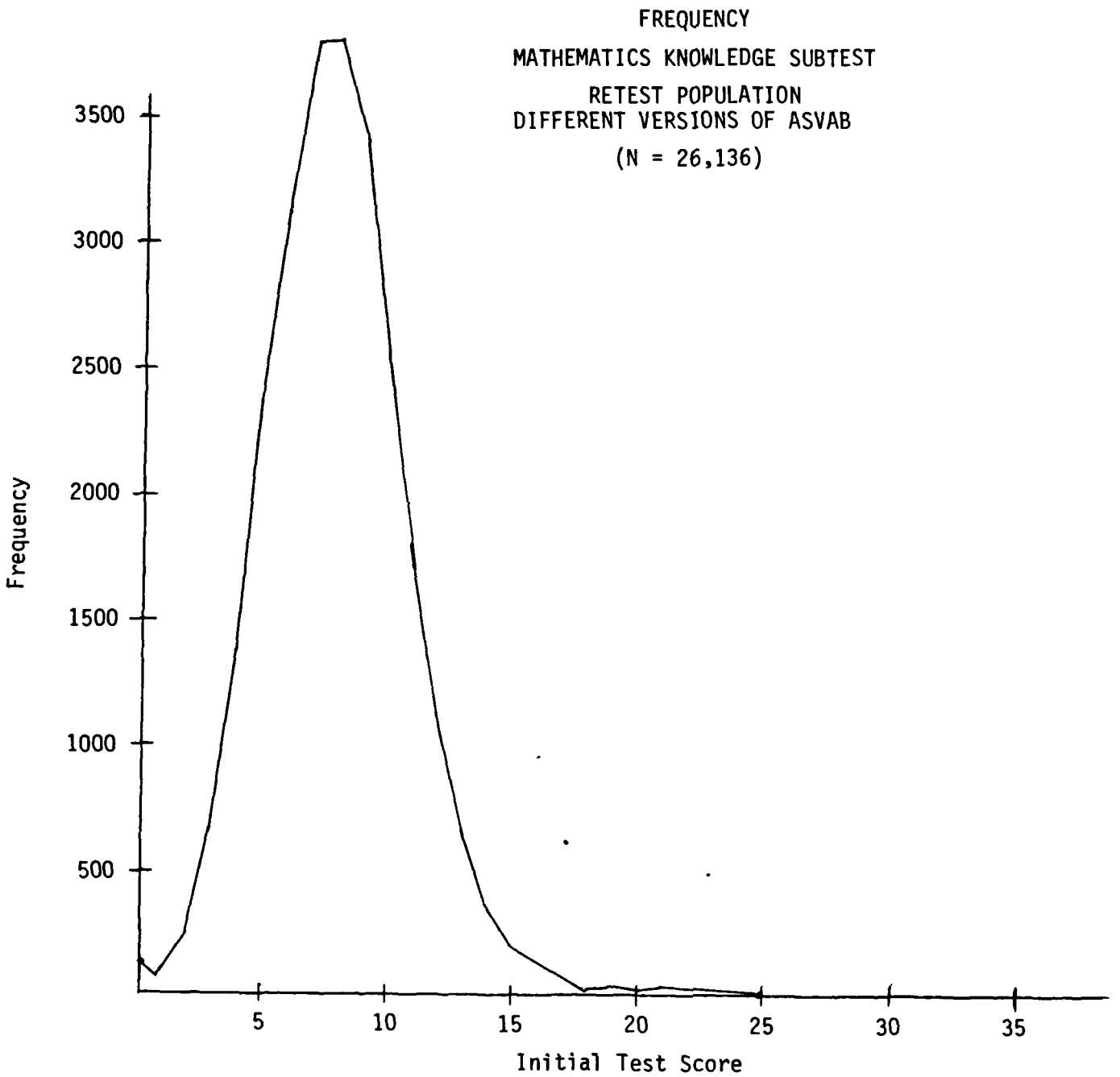
FREQUENCY

MATHEMATICS KNOWLEDGE SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)



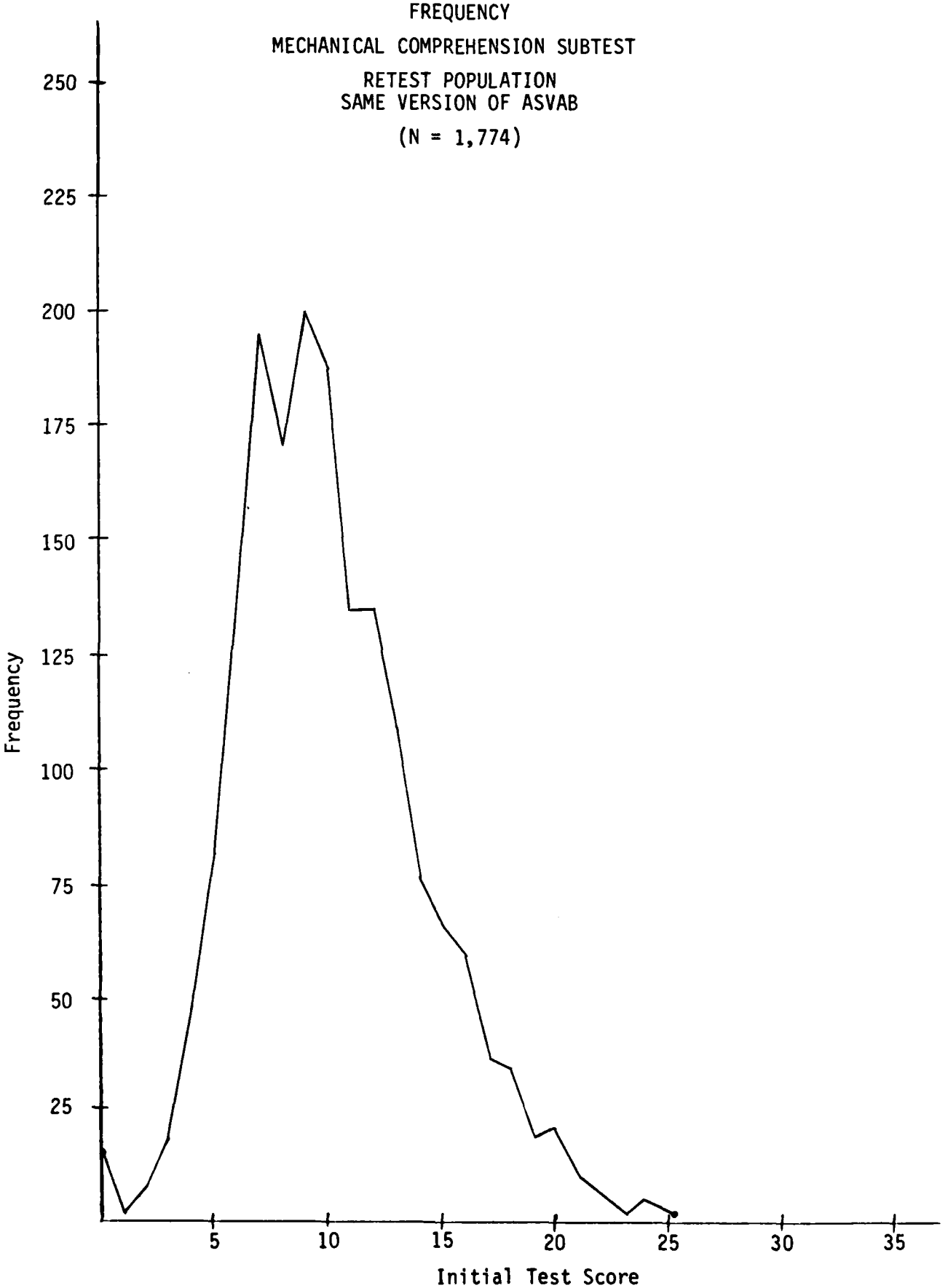

FREQUENCY
MATHEMATICS KNOWLEDGE SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Frequency
3500
3000
2500
2000
1500
1000
500
5
10
15
20
25
30
35
Initial Test Score

FREQUENCY

MECHANICAL COMPREHENSION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

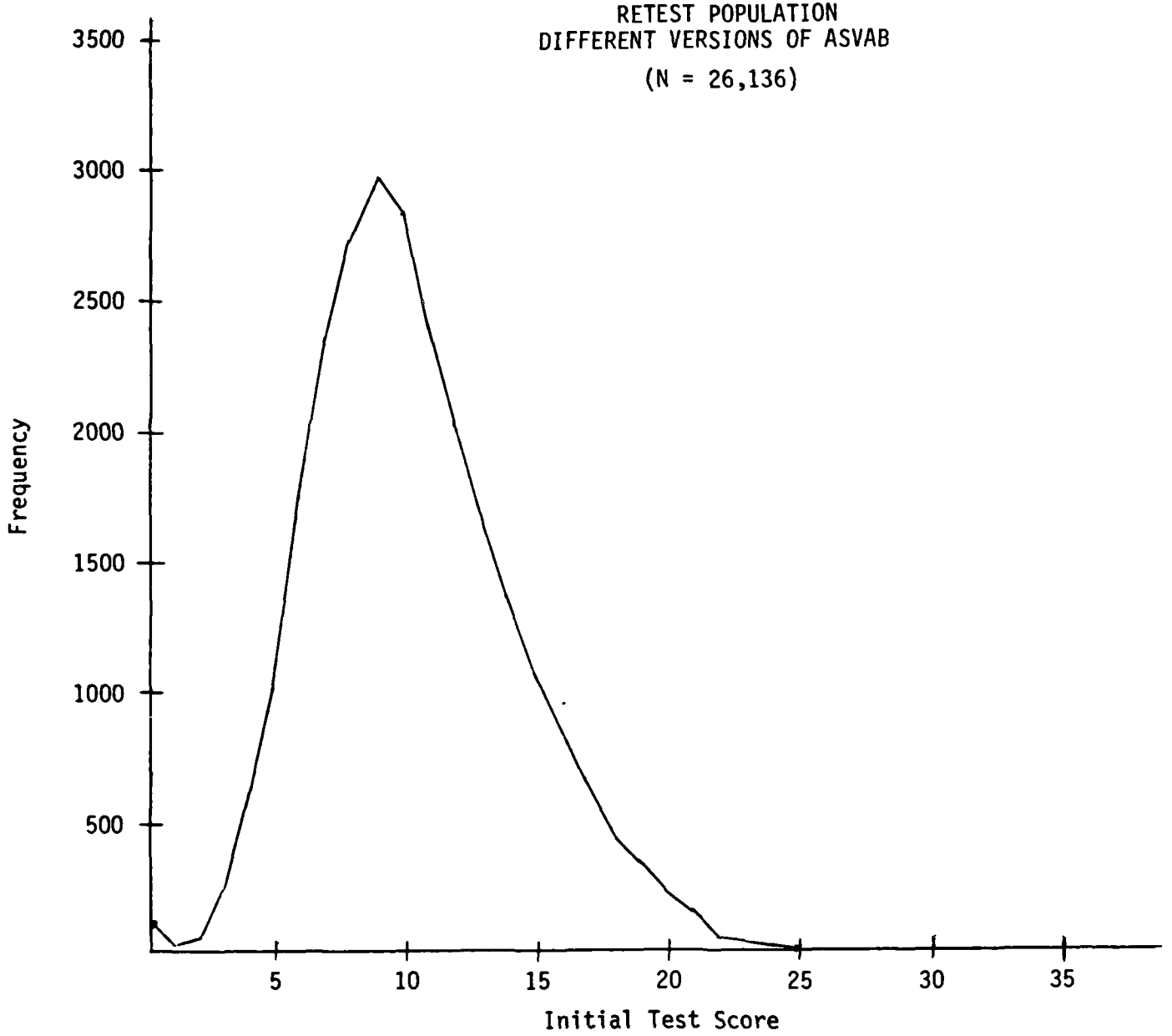


FREQUENCY

MECHANICAL COMPREHENSION SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

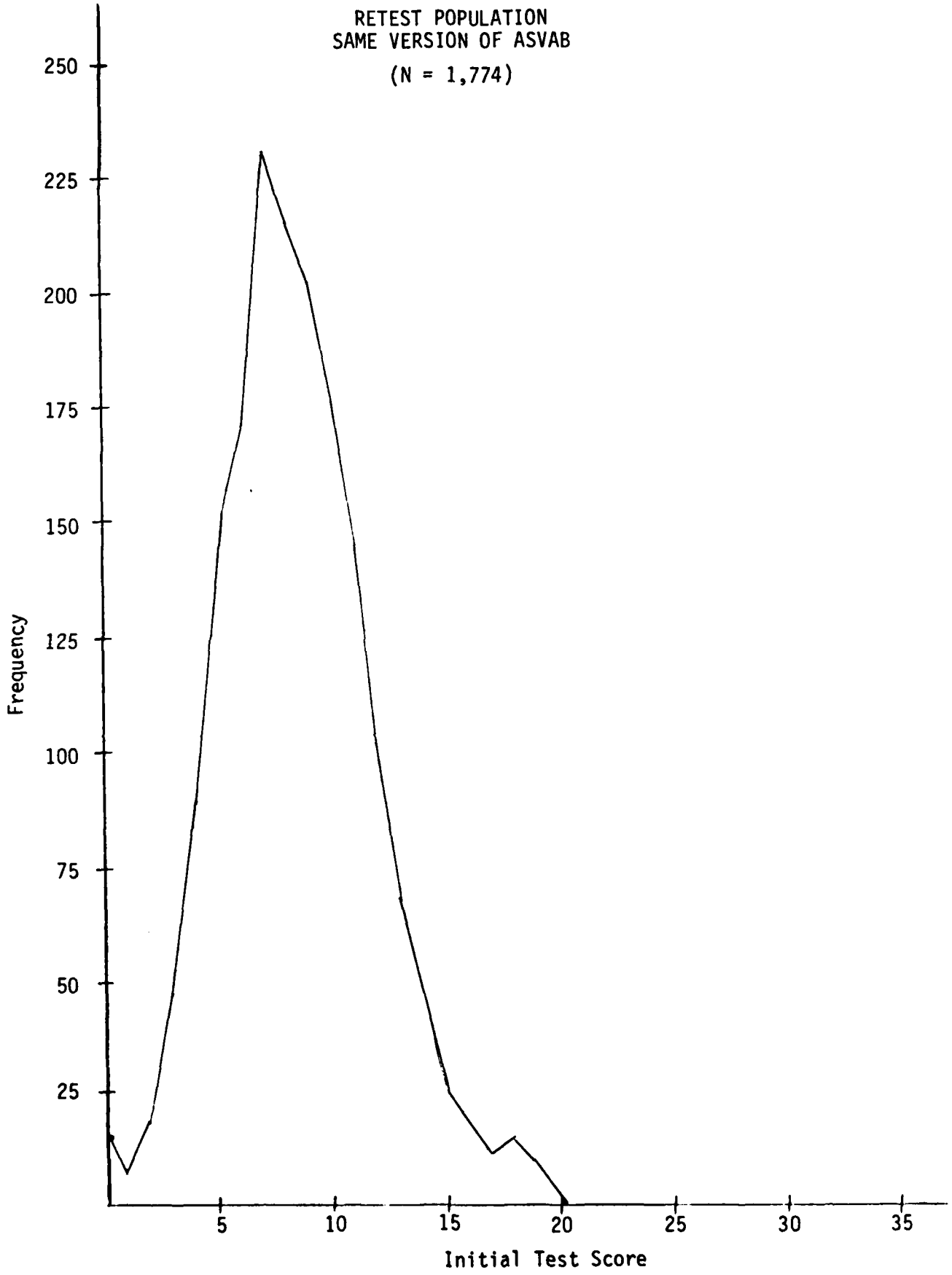


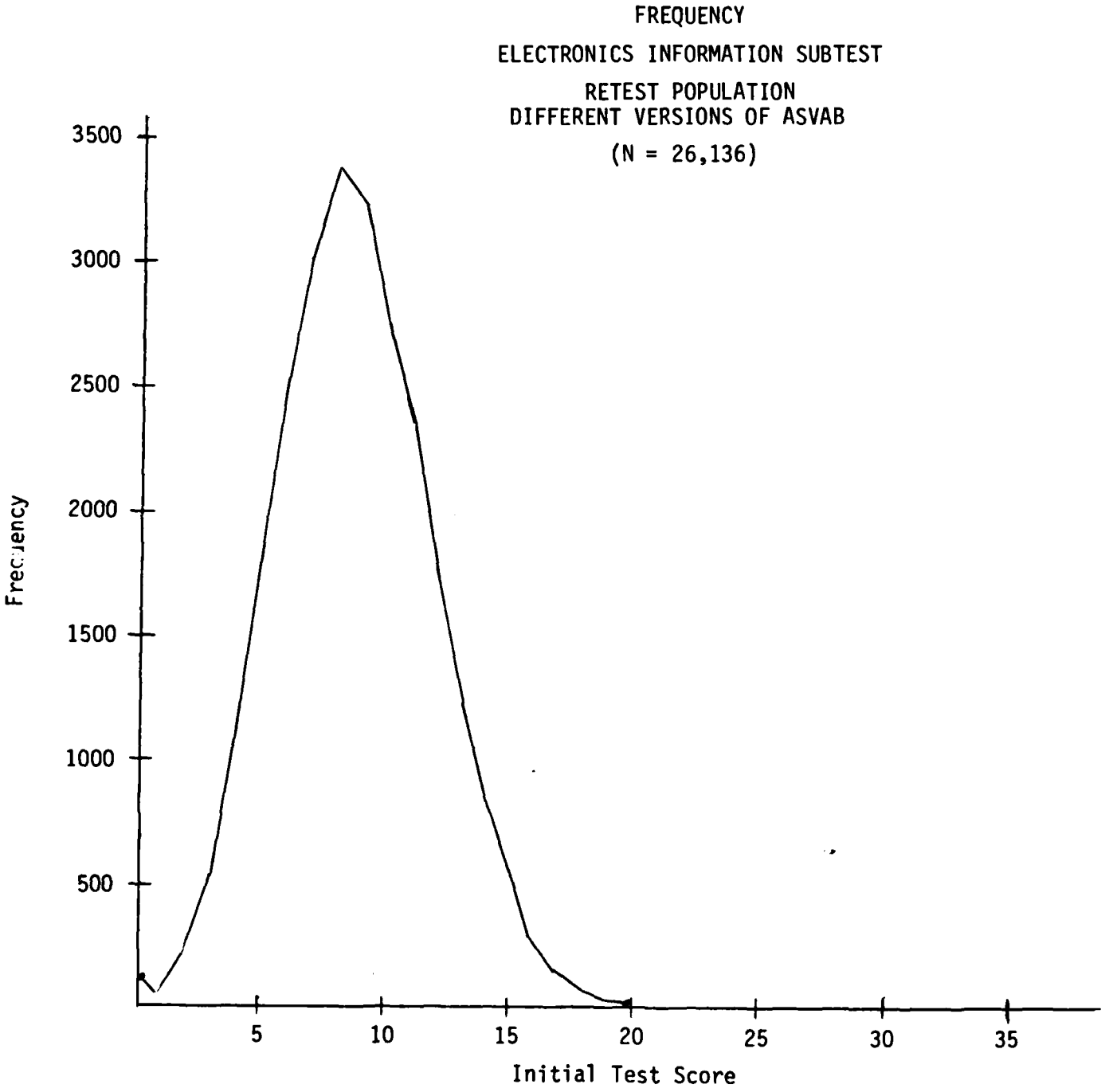
FREQUENCY

ELECTRONICS INFORMATION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)




FREQUENCY
ELECTRONICS INFORMATION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
3500
3000
2500
2000
1500
1000
500
Frequency
5
10
15
20
25
30
35
Initial Test Score

# APPENDIX B

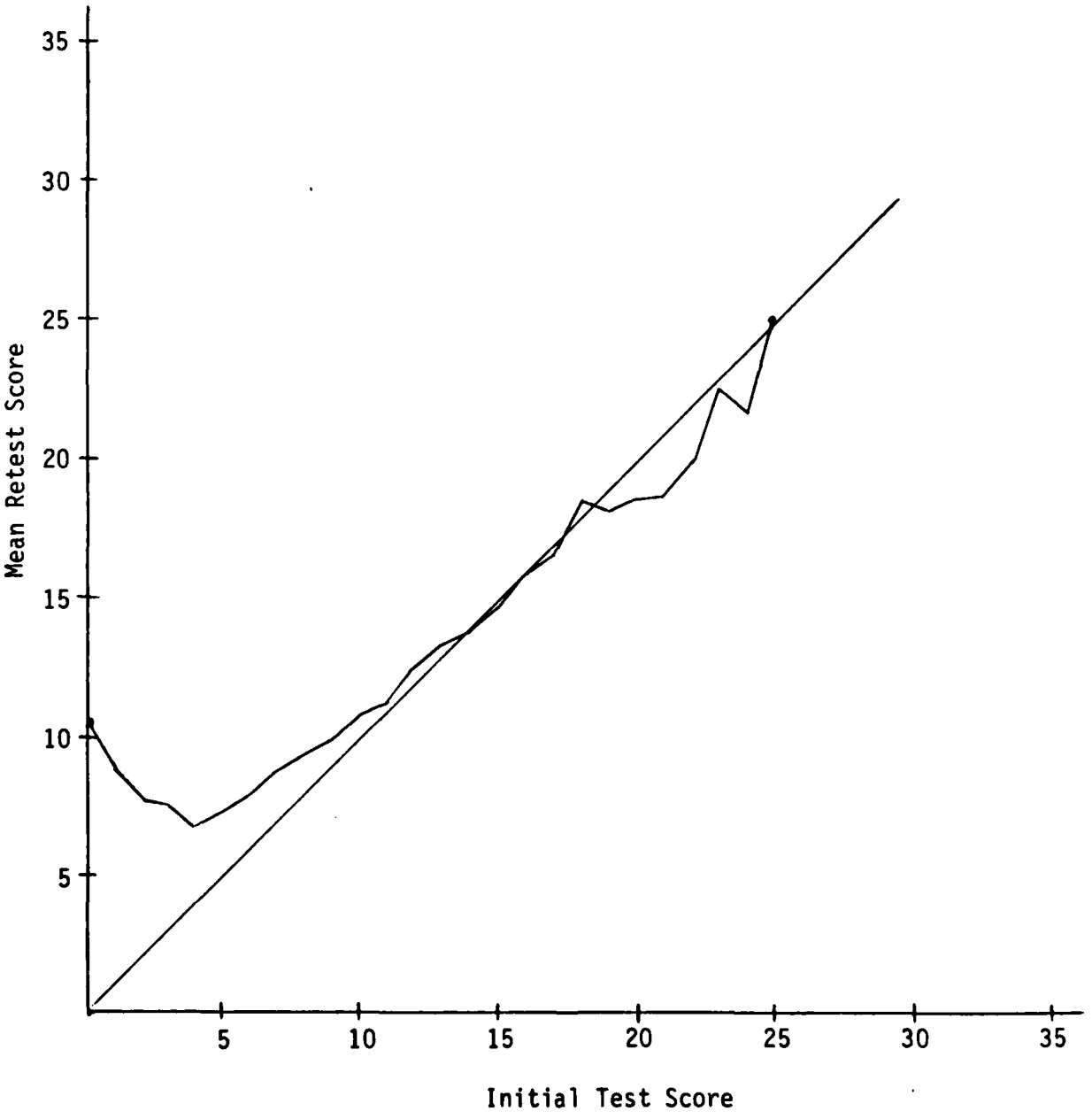
## MEAN RETEST SCORES FOR ASVAB SUBTESTS: RETESTED APPLICANT POOL

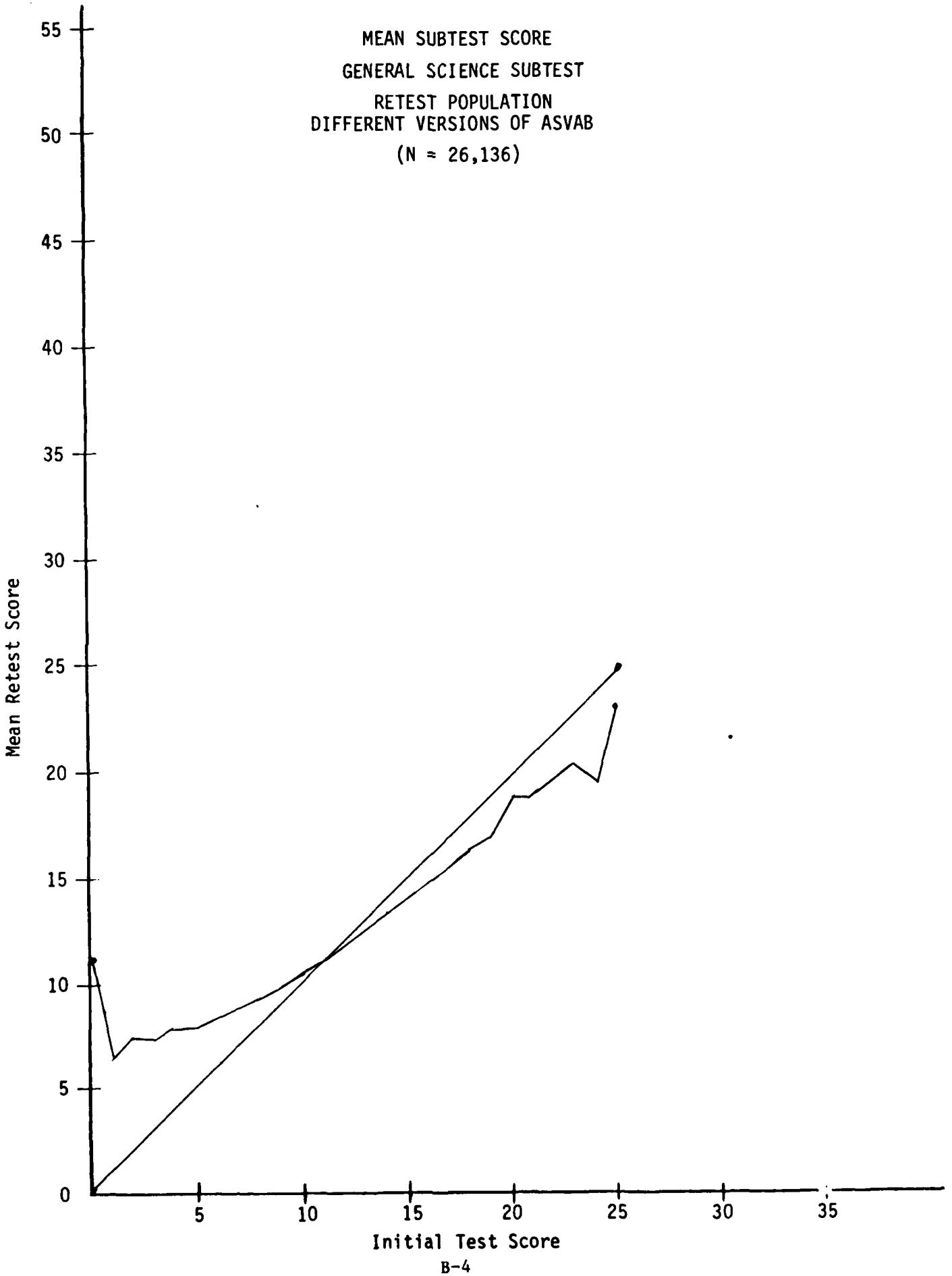
MEAN RETEST SCORE

GENERAL SCIENCE SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)



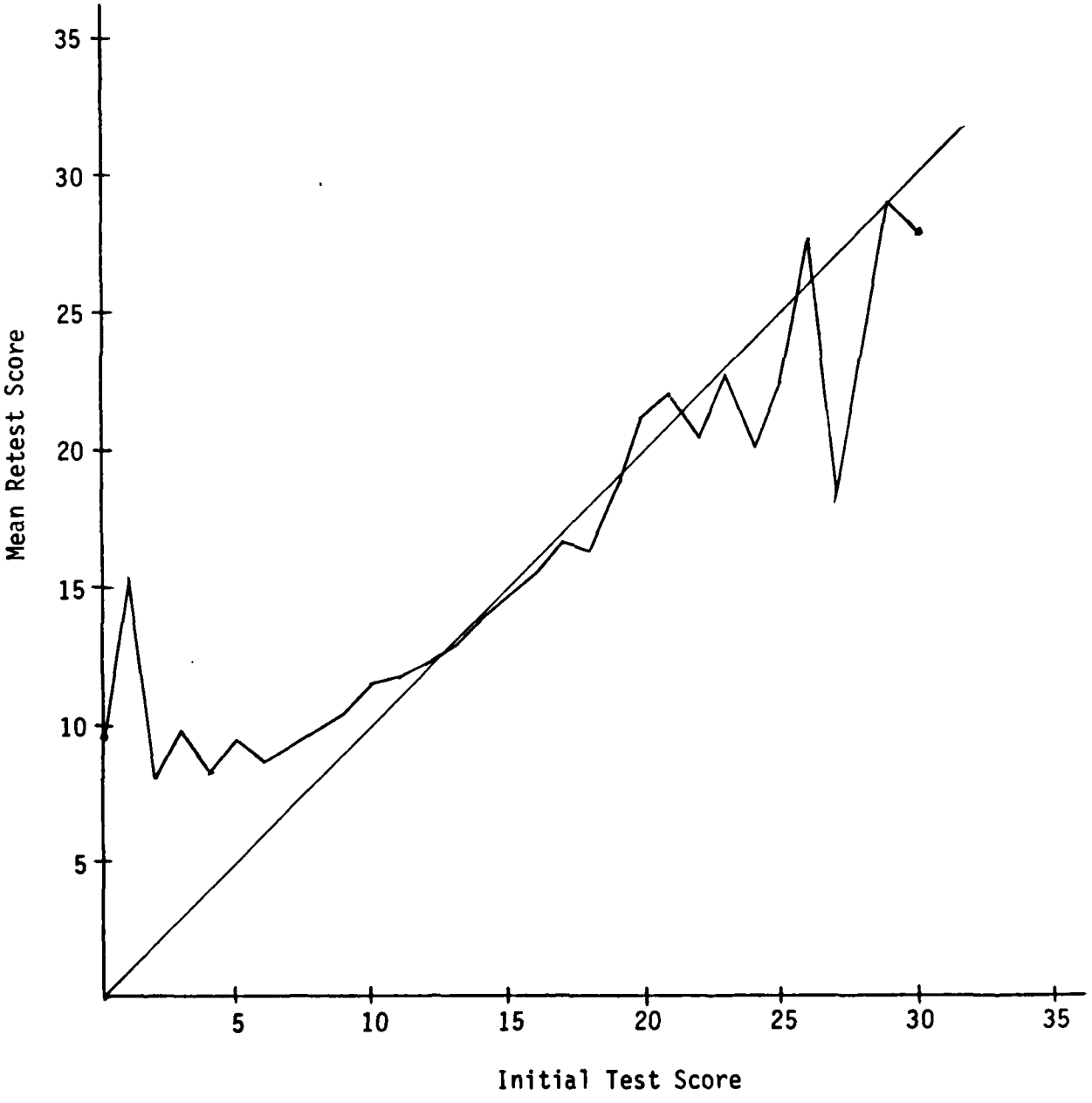

MEAN SUBTEST SCORE
GENERAL SCIENCE SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Mean Retest Score
Initial Test Score
0
5
10
15
20
25
30
35
40
45
50
55

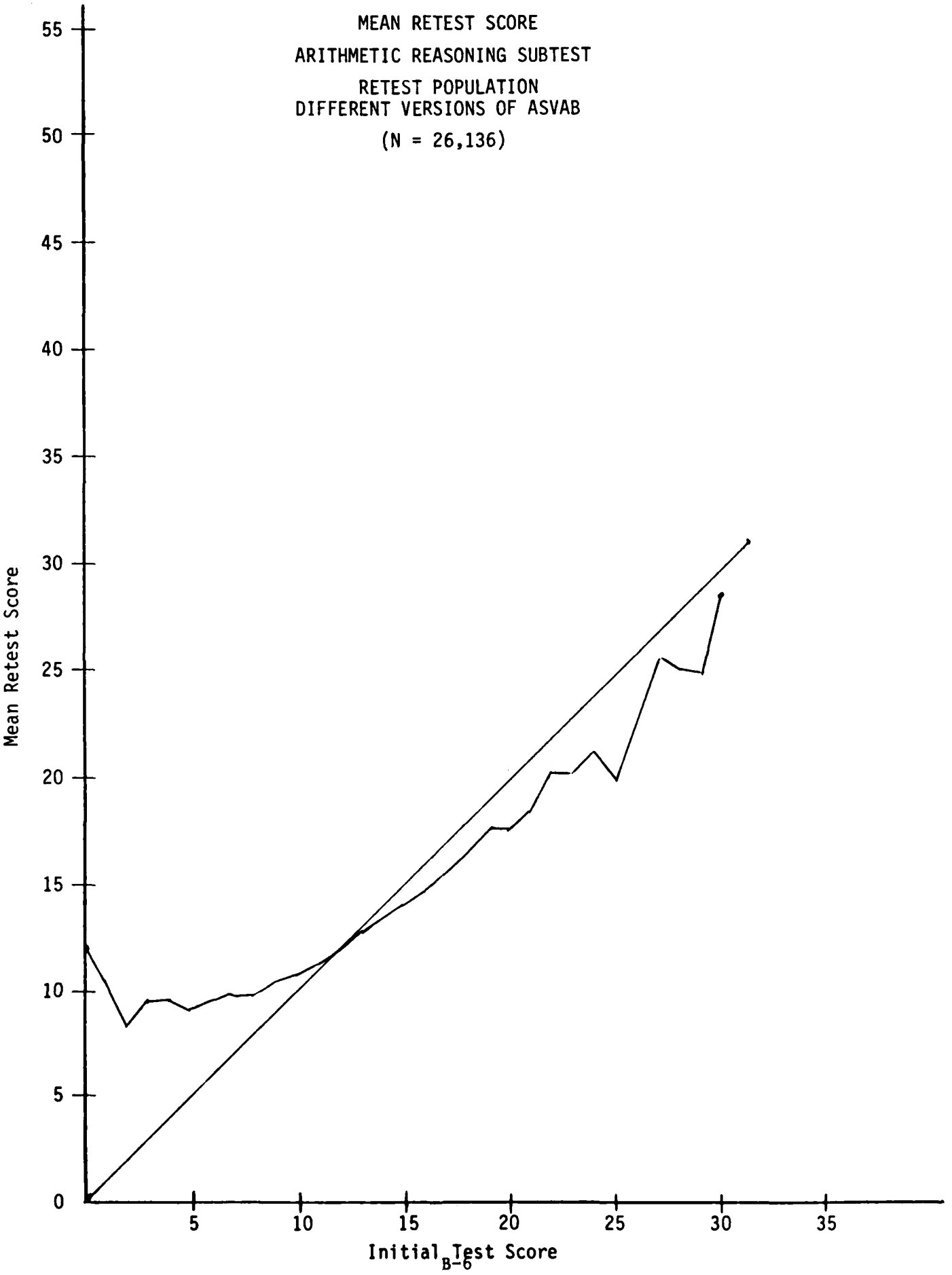
MEAN RETEST SCORE

ARITHMETIC REASONING SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)



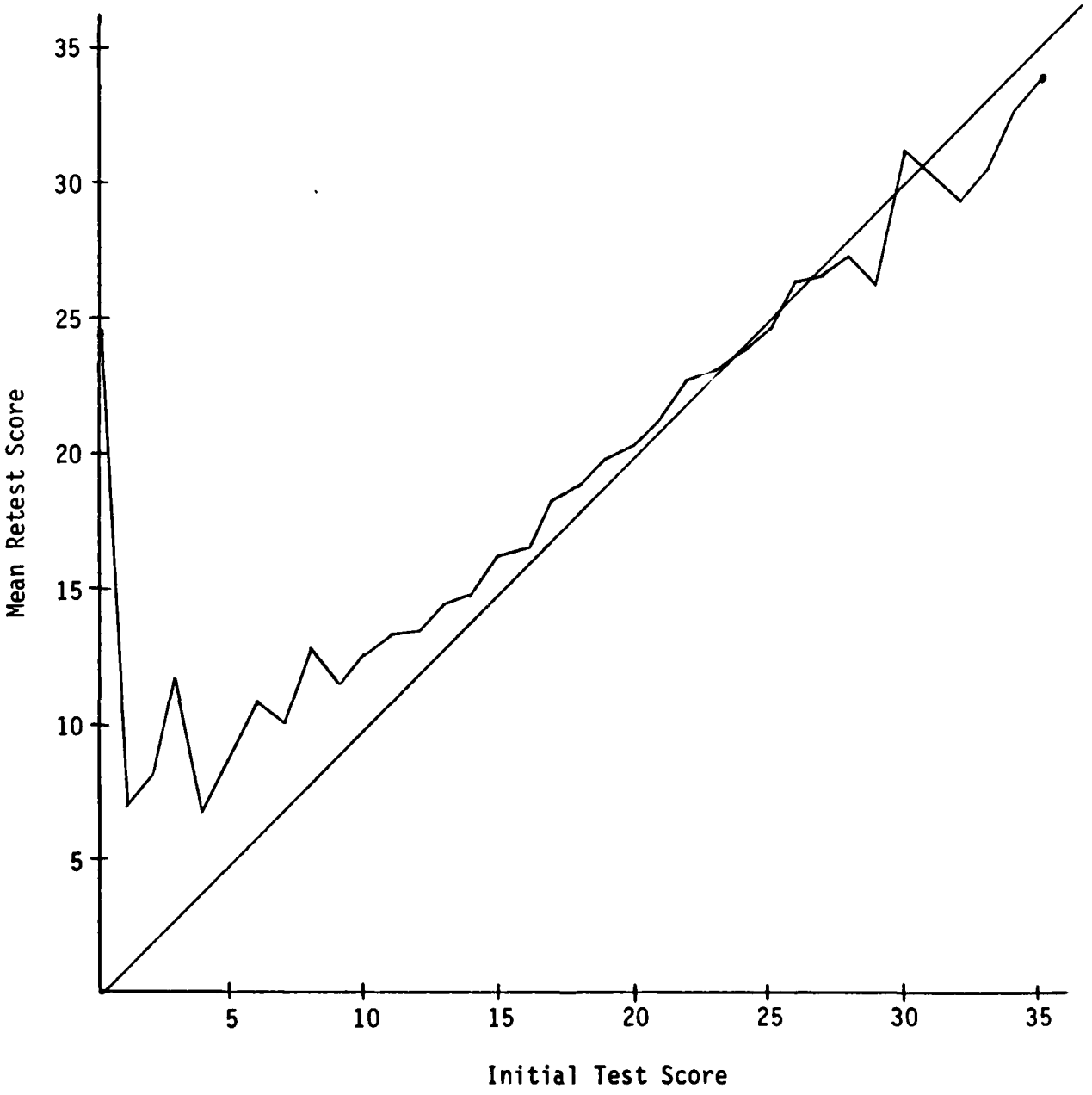

MEAN RETEST SCORE
ARITHMETIC REASONING SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Mean Retest Score
Initial Test Score
0
5
10
15
20
25
30
35
40
45
50
55

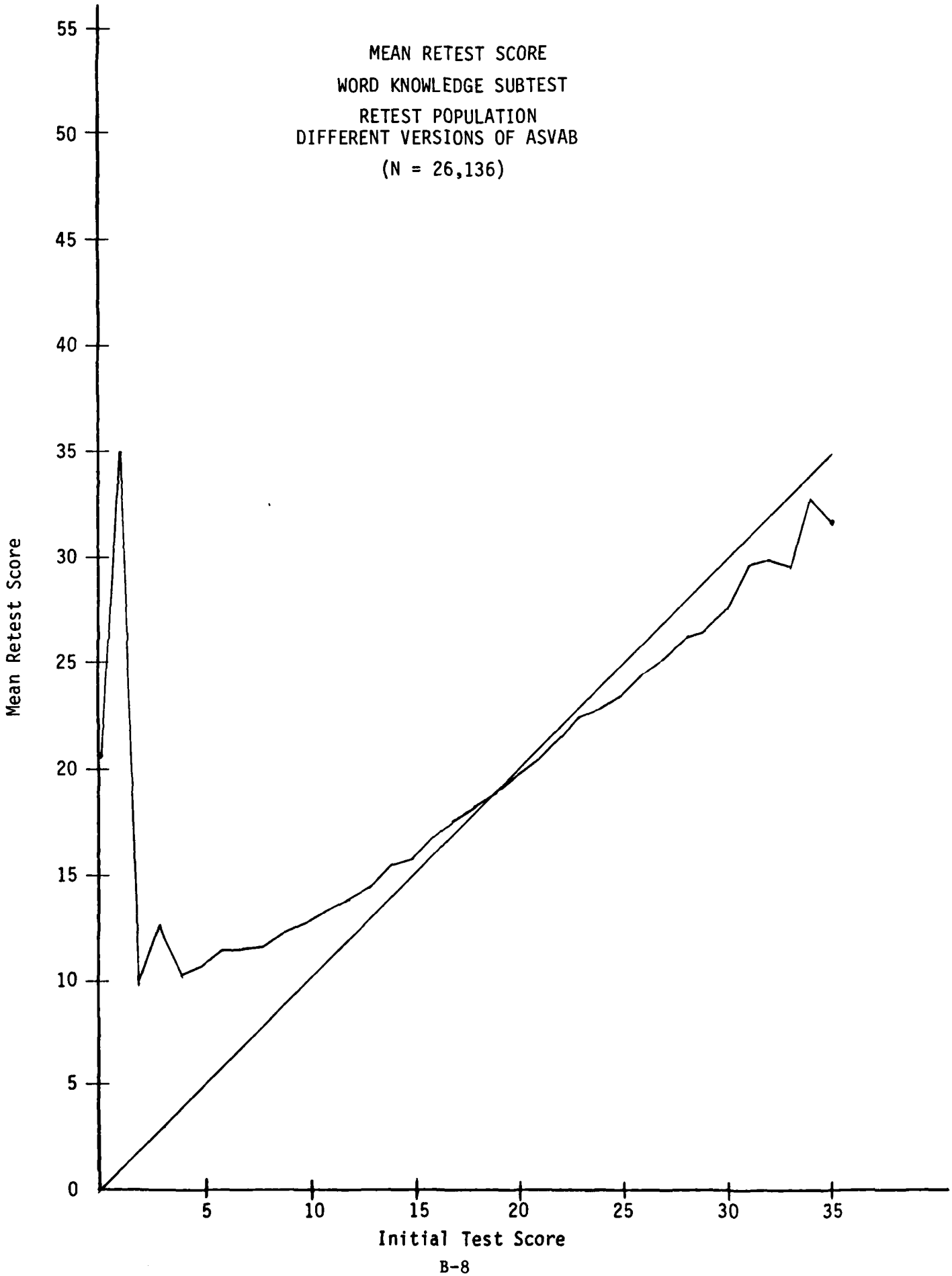
MEAN RETEST SCORE

WORD KNOWLEDGE SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)



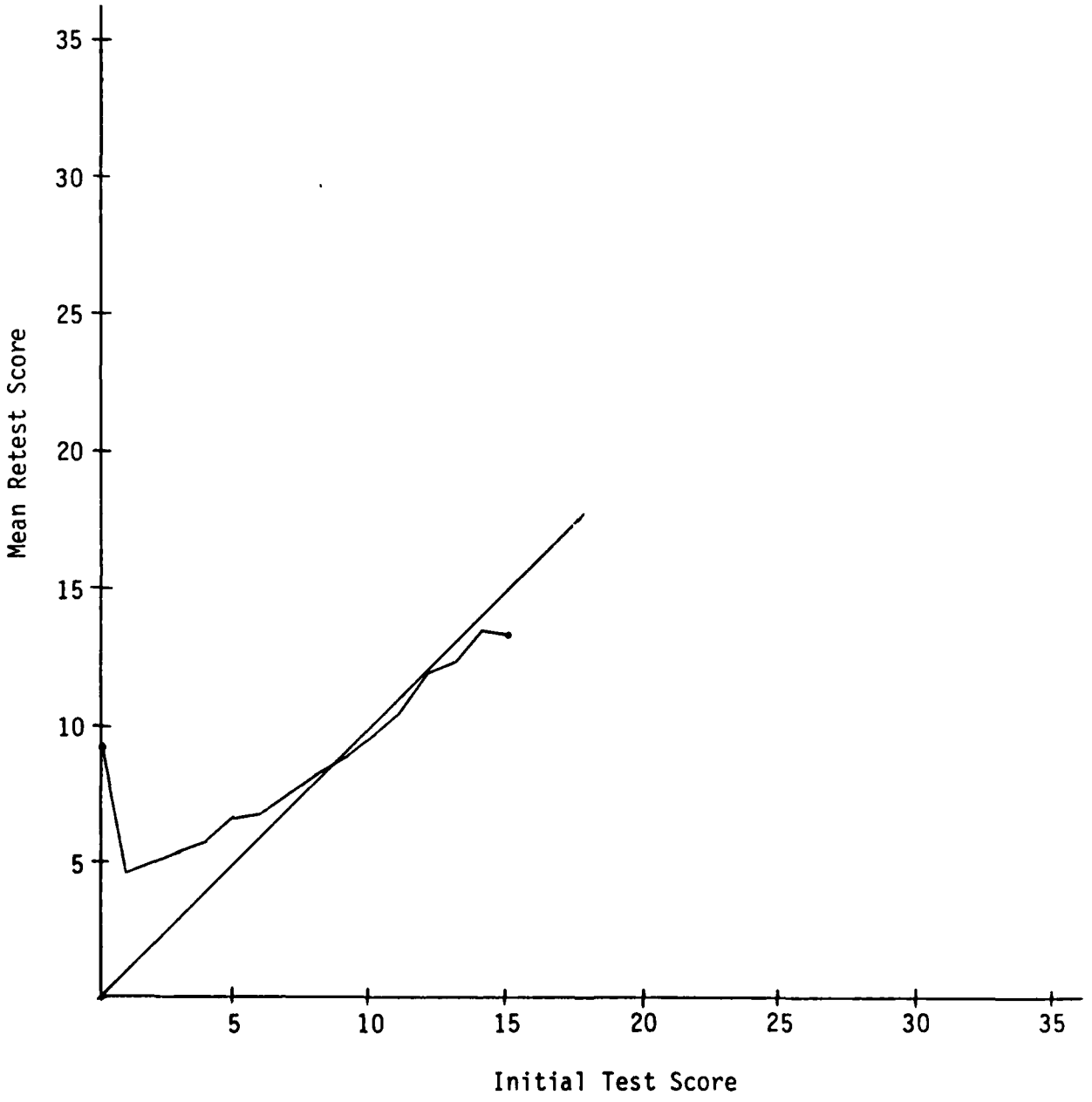

MEAN RETEST SCORE
WORD KNOWLEDGE SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Mean Retest Score
Initial Test Score
0
5
10
15
20
25
30
35
40
45
50
55

MEAN RETEST SCORE

PARAGRAPH COMPREHENSION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

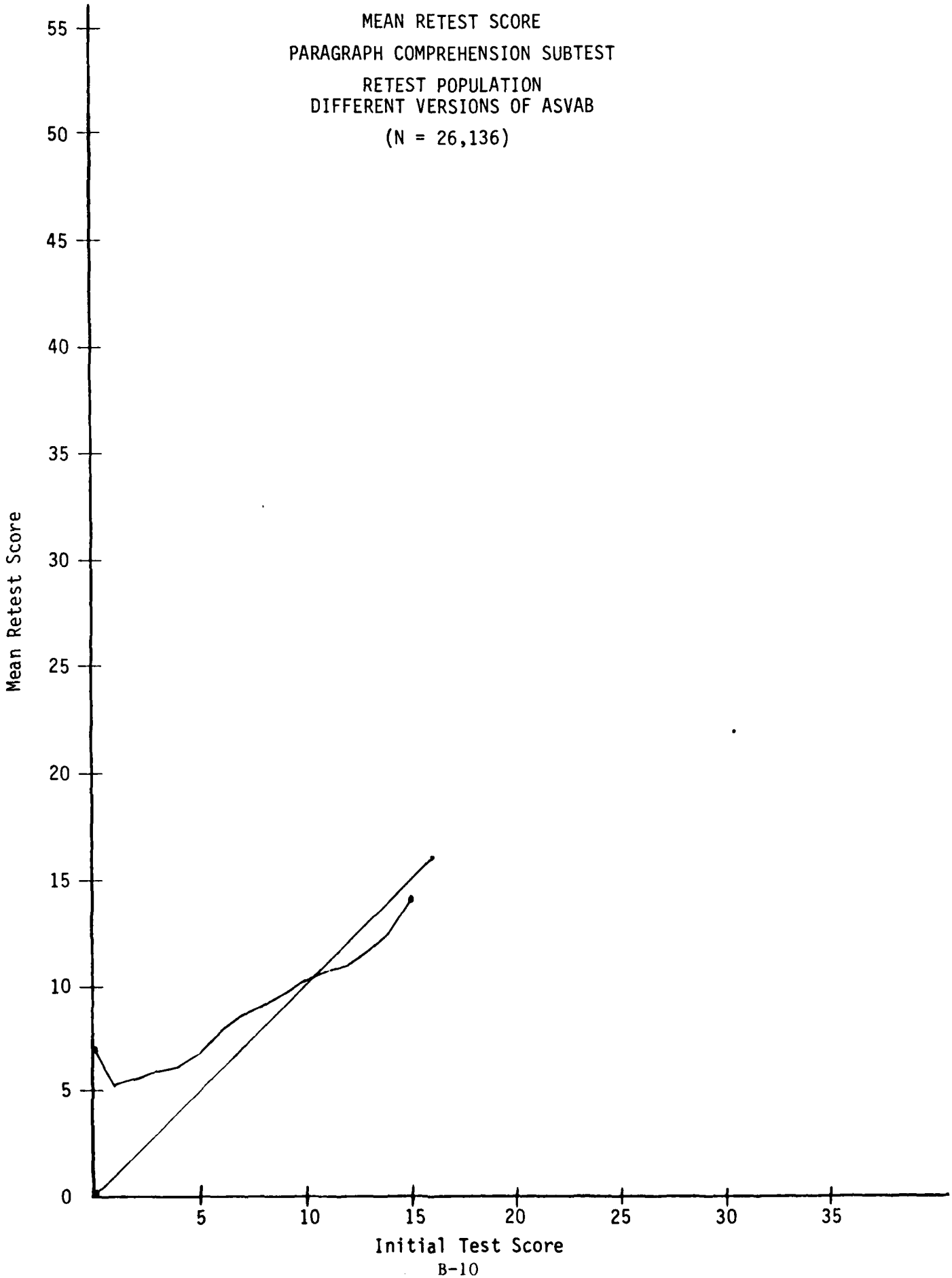


MEAN RETEST SCORE

PARAGRAPH COMPREHENSION SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

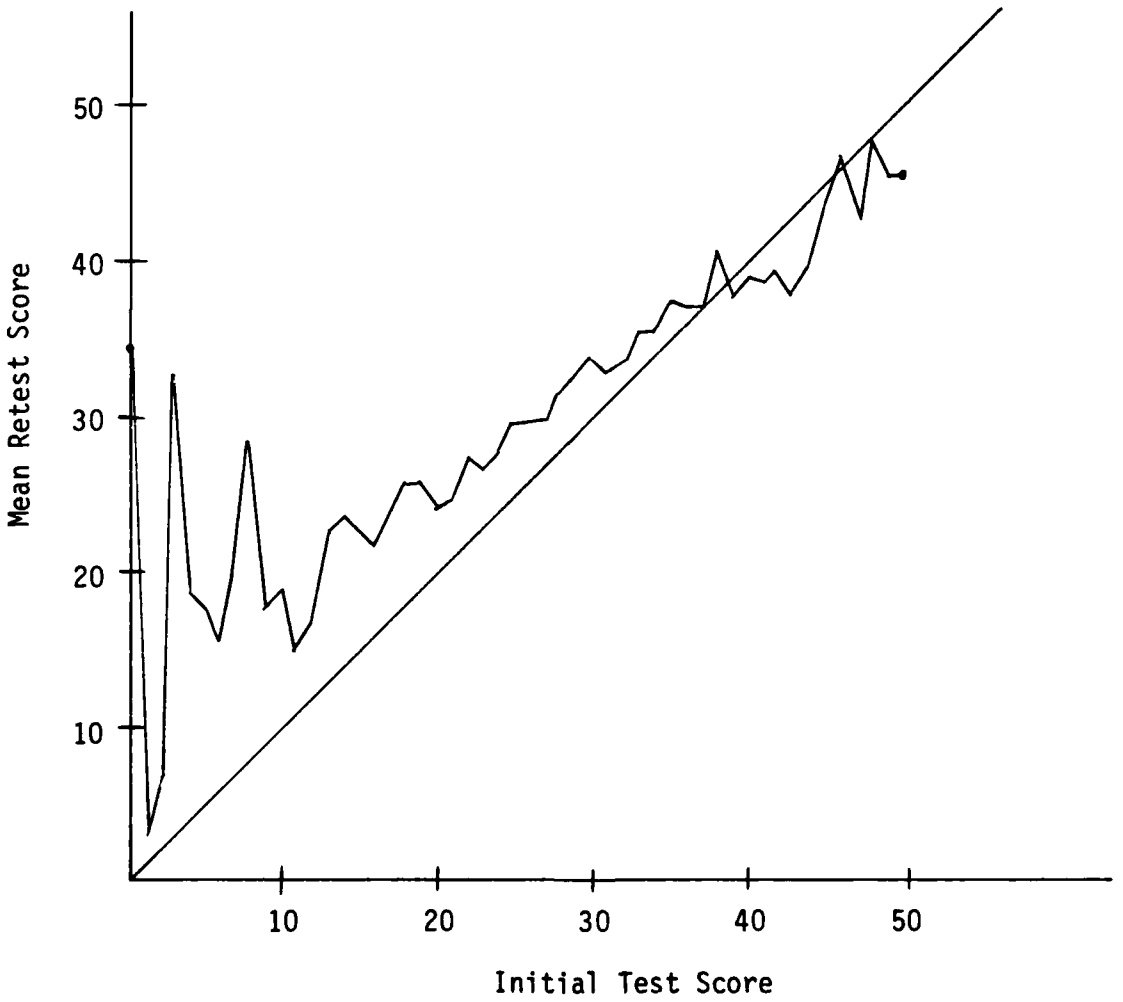


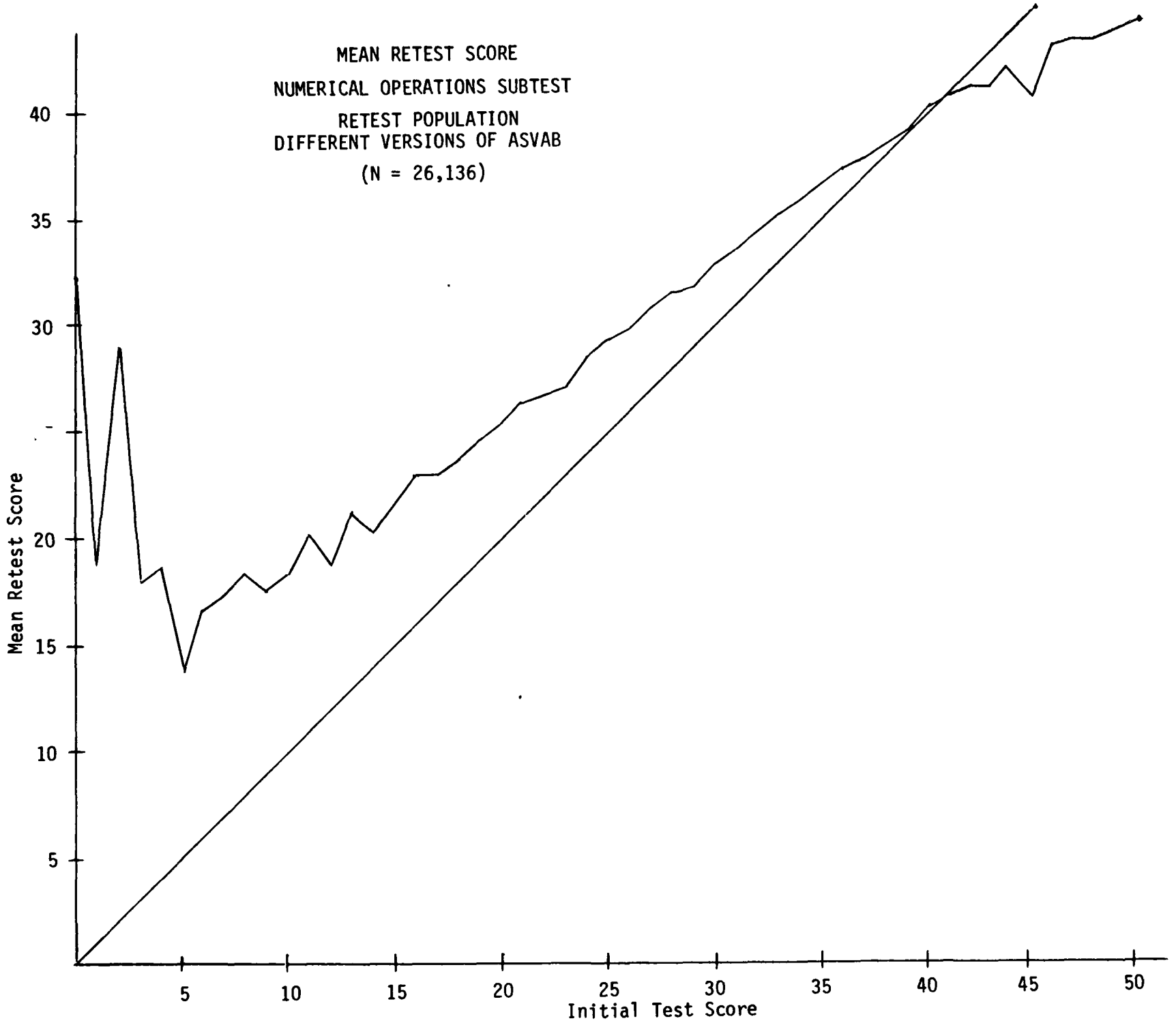
MEAN RETEST SCORE

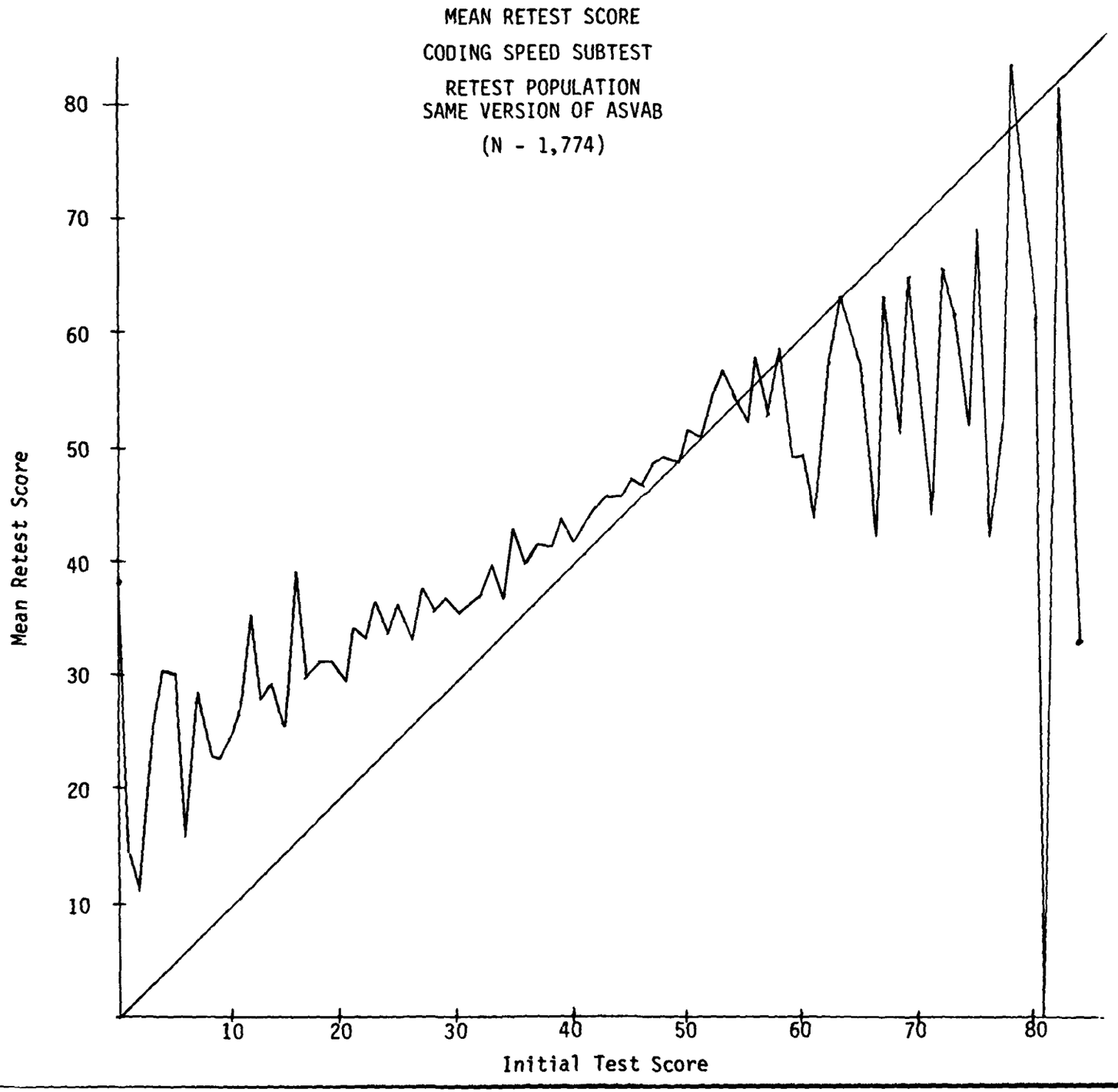
NUMERICAL OPERATIONS SUBTEST

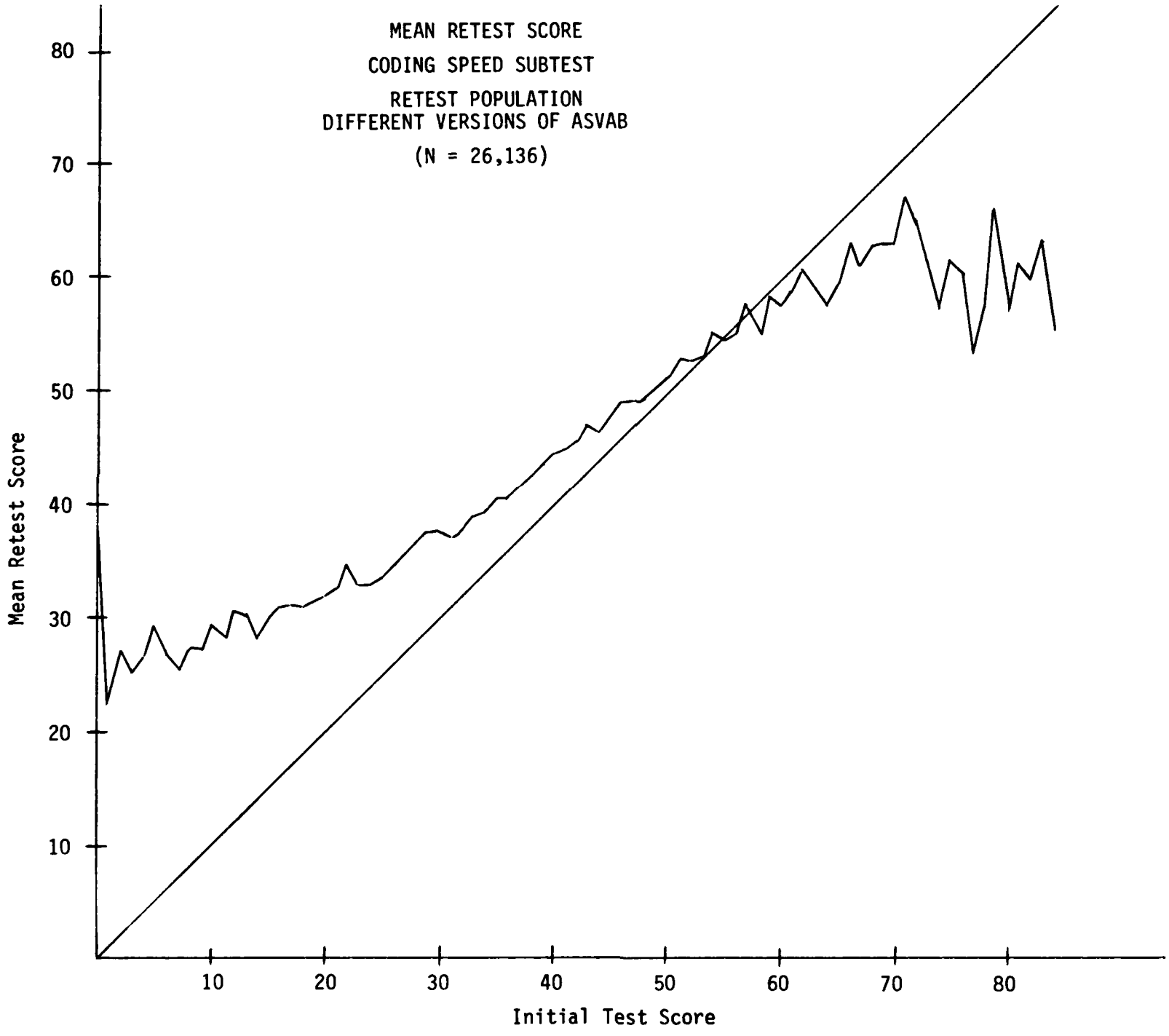
RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)




MEAN RETEST SCORE
NUMERICAL OPERATIONS SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Mean Retest Score
40
35
30
20
15
10
5
5
10
15
20
25
30
35
40
45
50
Initial Test Score


MEAN RETEST SCORE
CODING SPEED SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N - 1,774)
Mean Retest Score
Initial Test Score
10
20
30
40
50
60
70
80

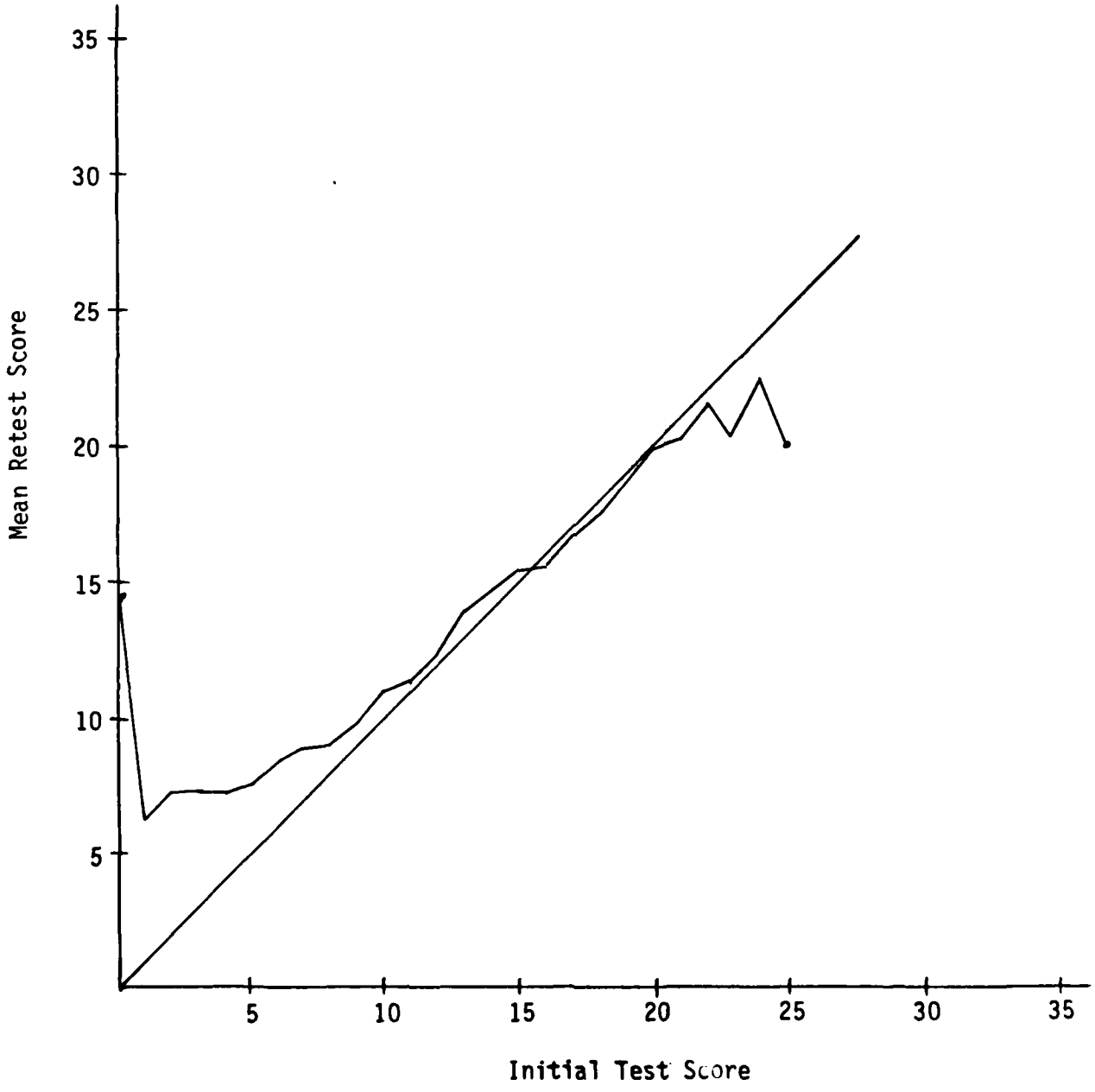

MEAN RETEST SCORE
CODING SPEED SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Mean Retest Score
Initial Test Score
10
20
30
40
50
60
70
80

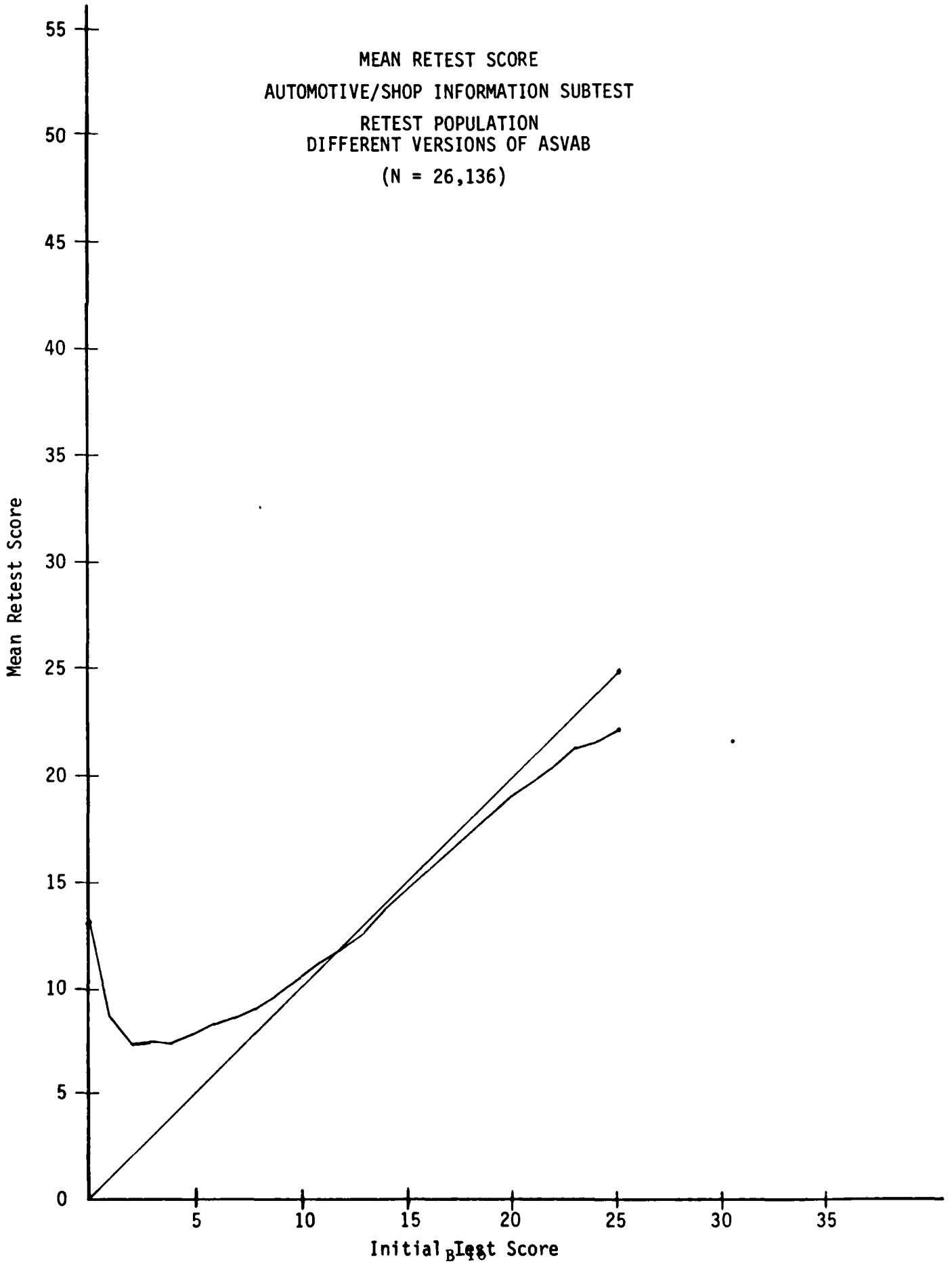
MEAN RETEST SCORE

AUTOMOTIVE/SHOP INFORMATION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)



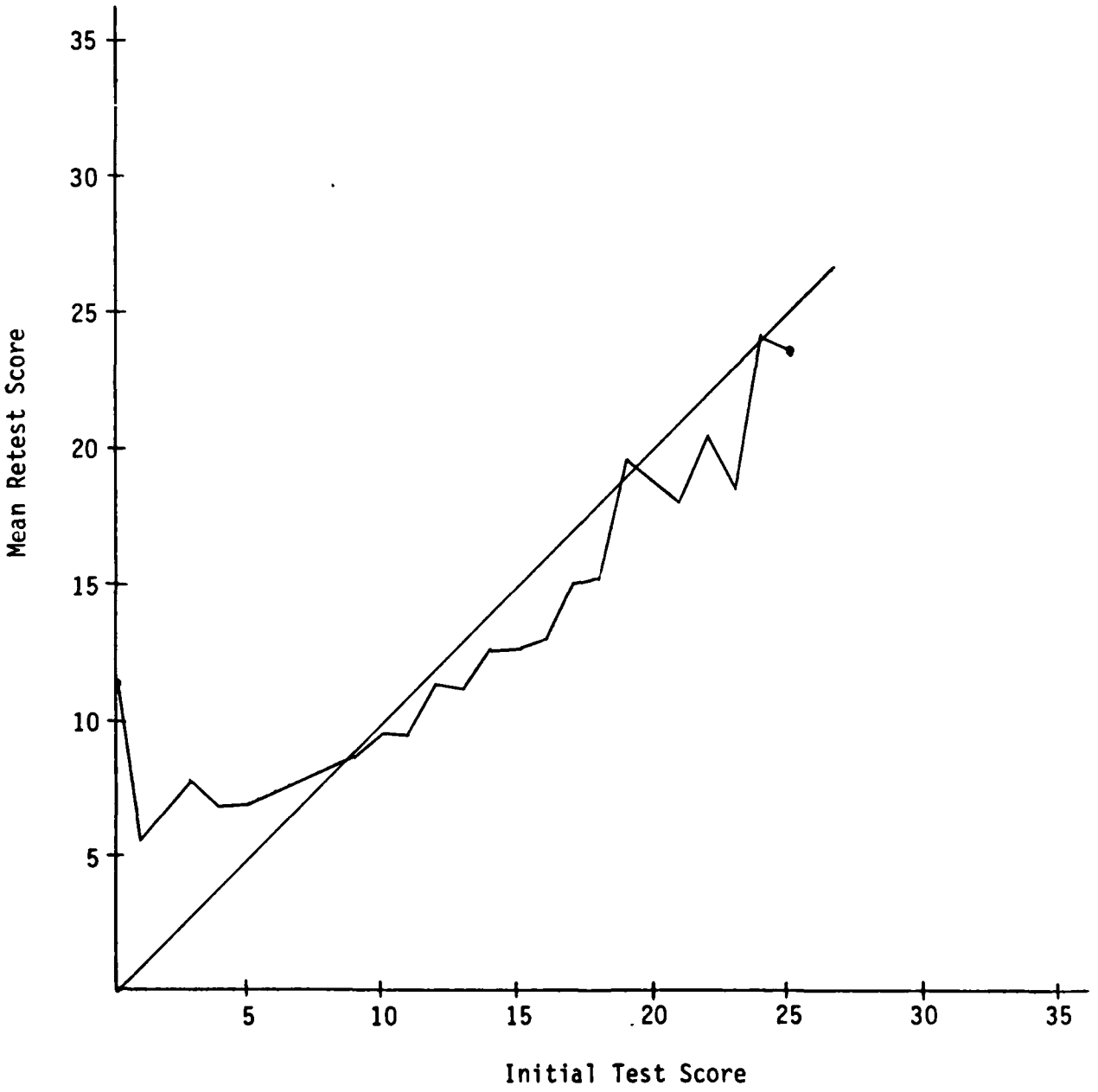

MEAN RETEST SCORE
AUTOMOTIVE/SHOP INFORMATION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Mean Retest Score
55
50
45
40
35
30
25
20
15
10
5
0
5
10
15
20
25
30
35
Initial Test Score

MEAN RETEST SCORE

MATHEMATICS KNOWLEDGE SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

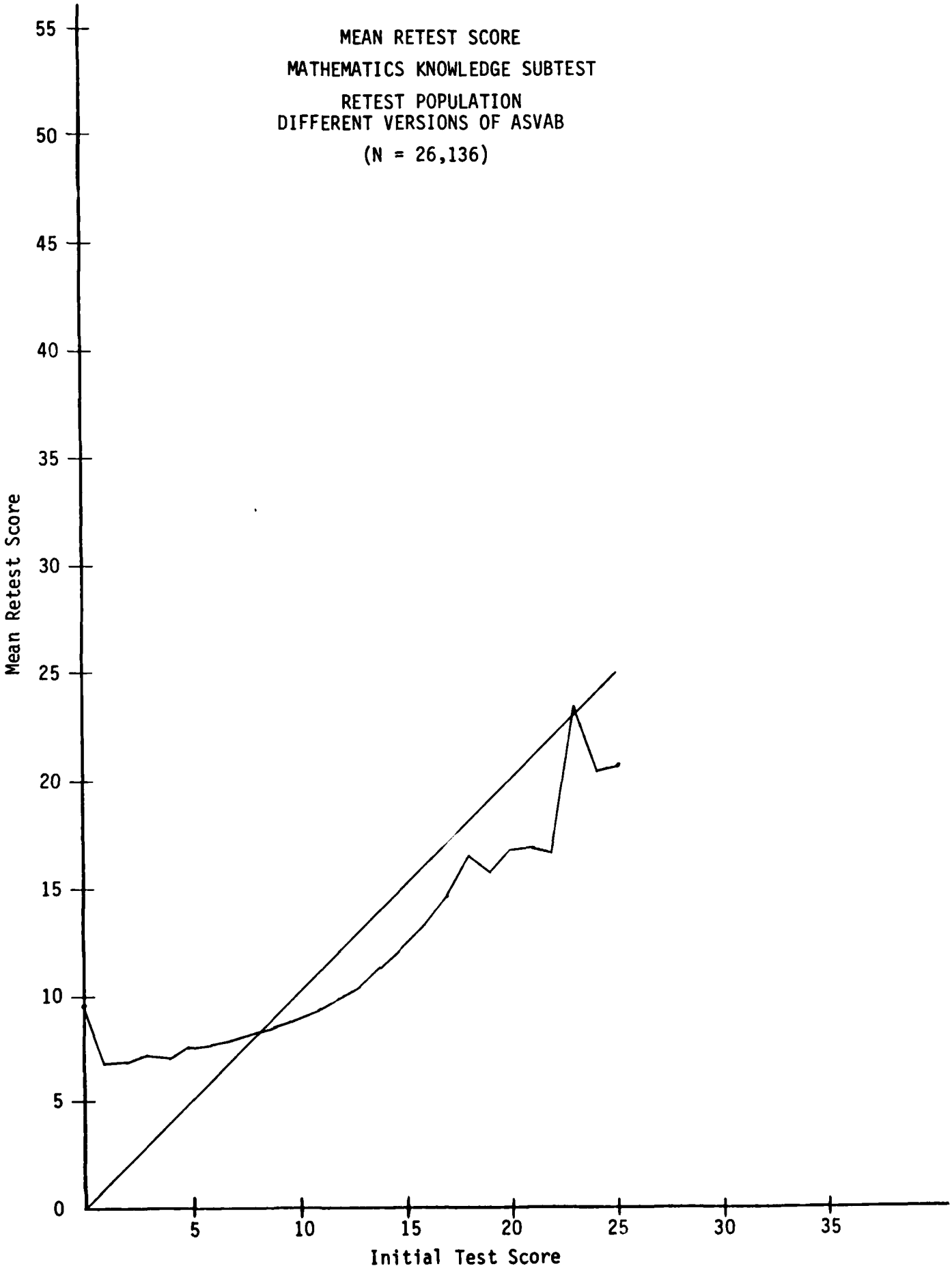


MEAN RETEST SCORE

MATHEMATICS KNOWLEDGE SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

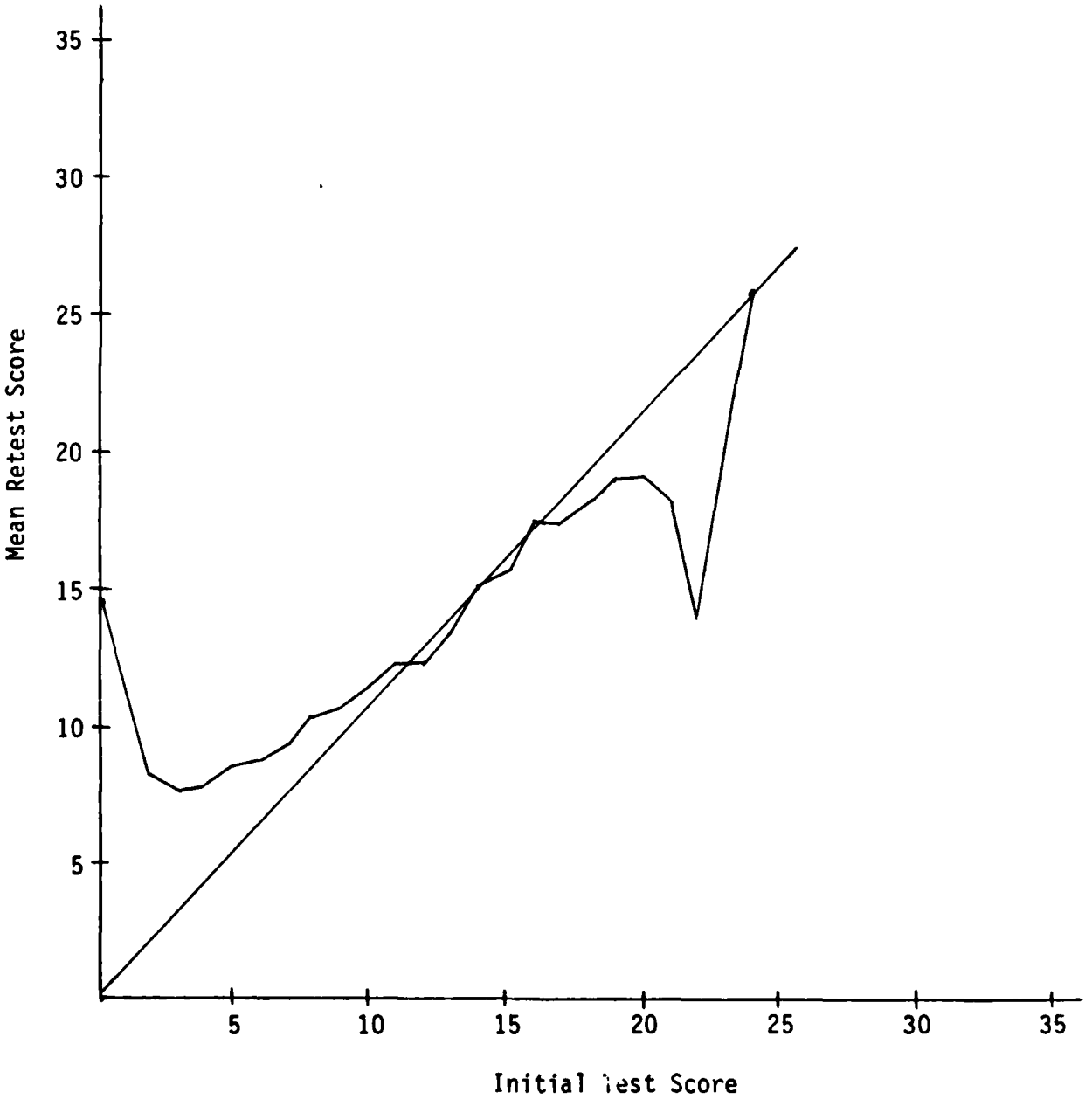


MEAN RETEST SCORE

MECHANICAL COMPREHENSION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

(N = 1,774)

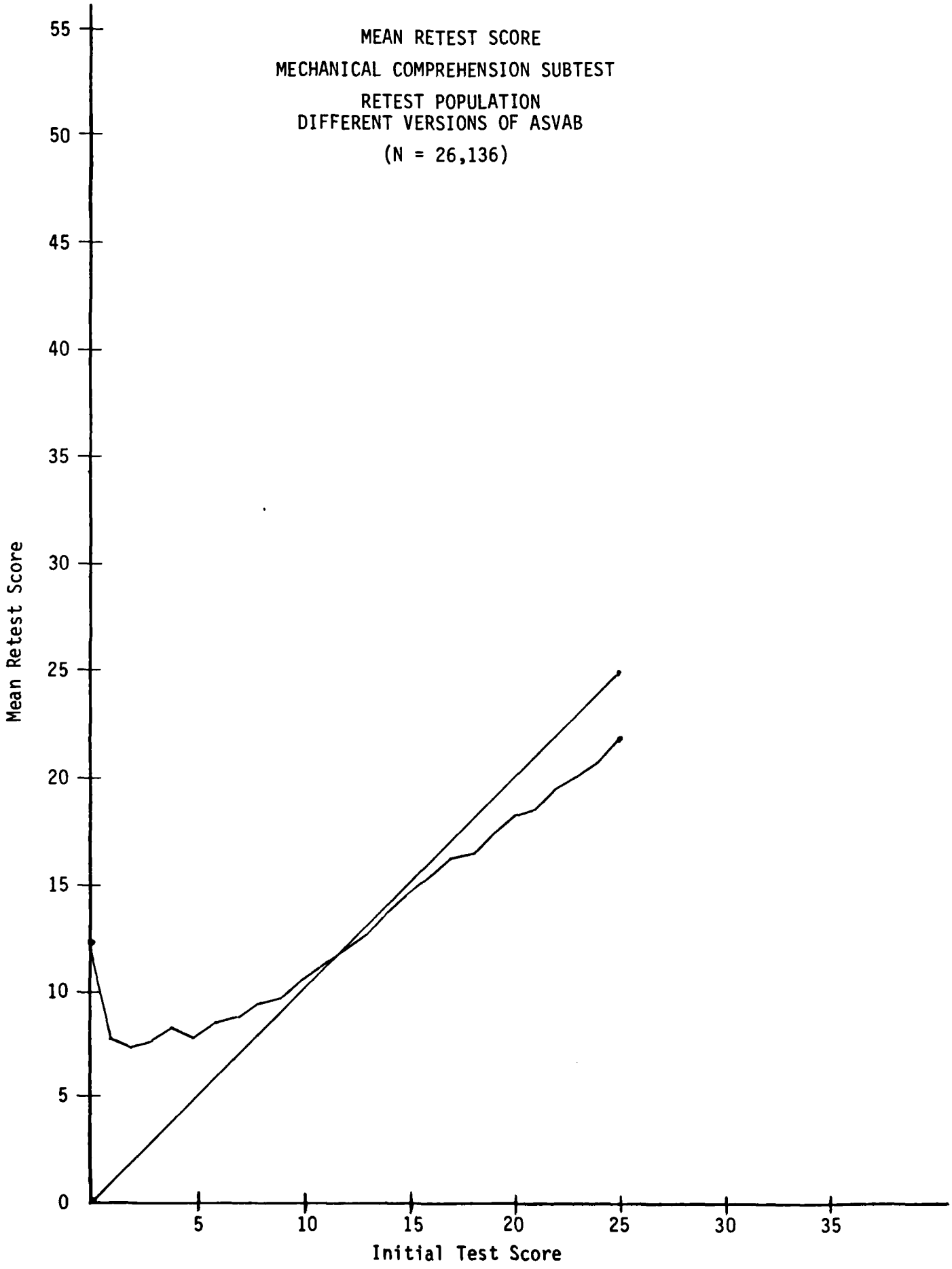


MEAN RETEST SCORE

MECHANICAL COMPREHENSION SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

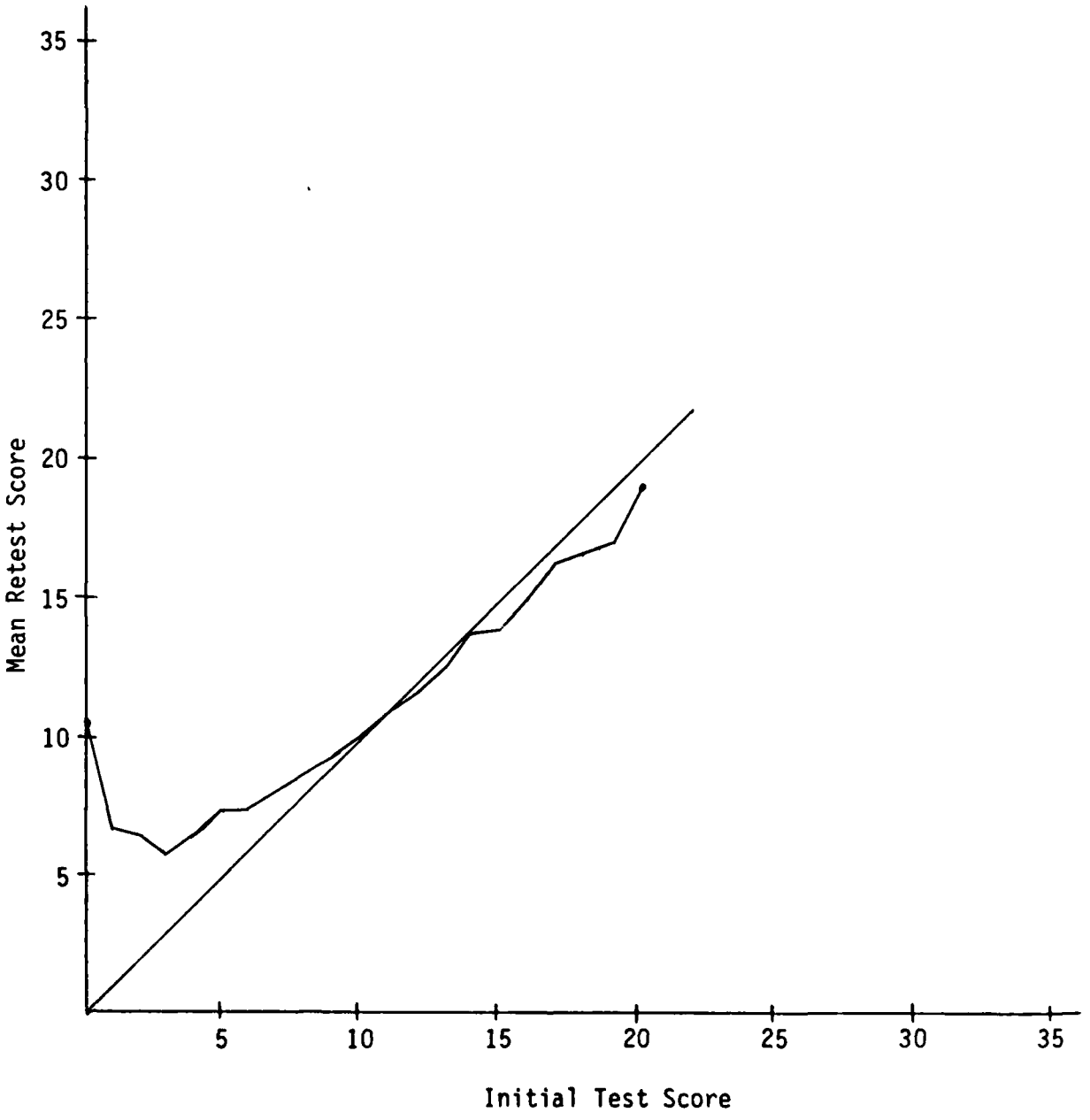


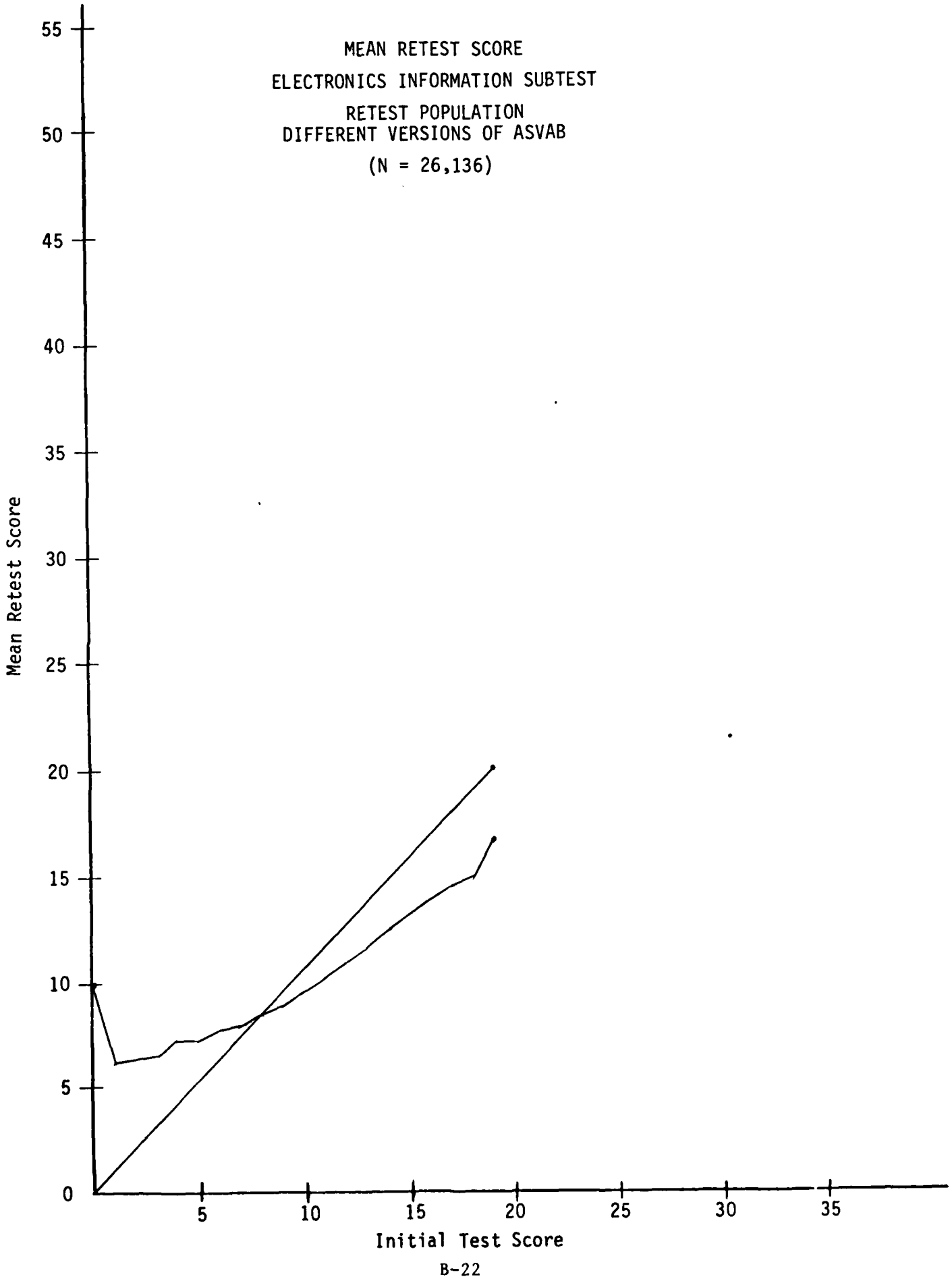
MEAN RETEST SCORE

ELECTRONICS INFORMATION SUBTEST

RETEST POPULATION
SAME VERSION OF ASVAB

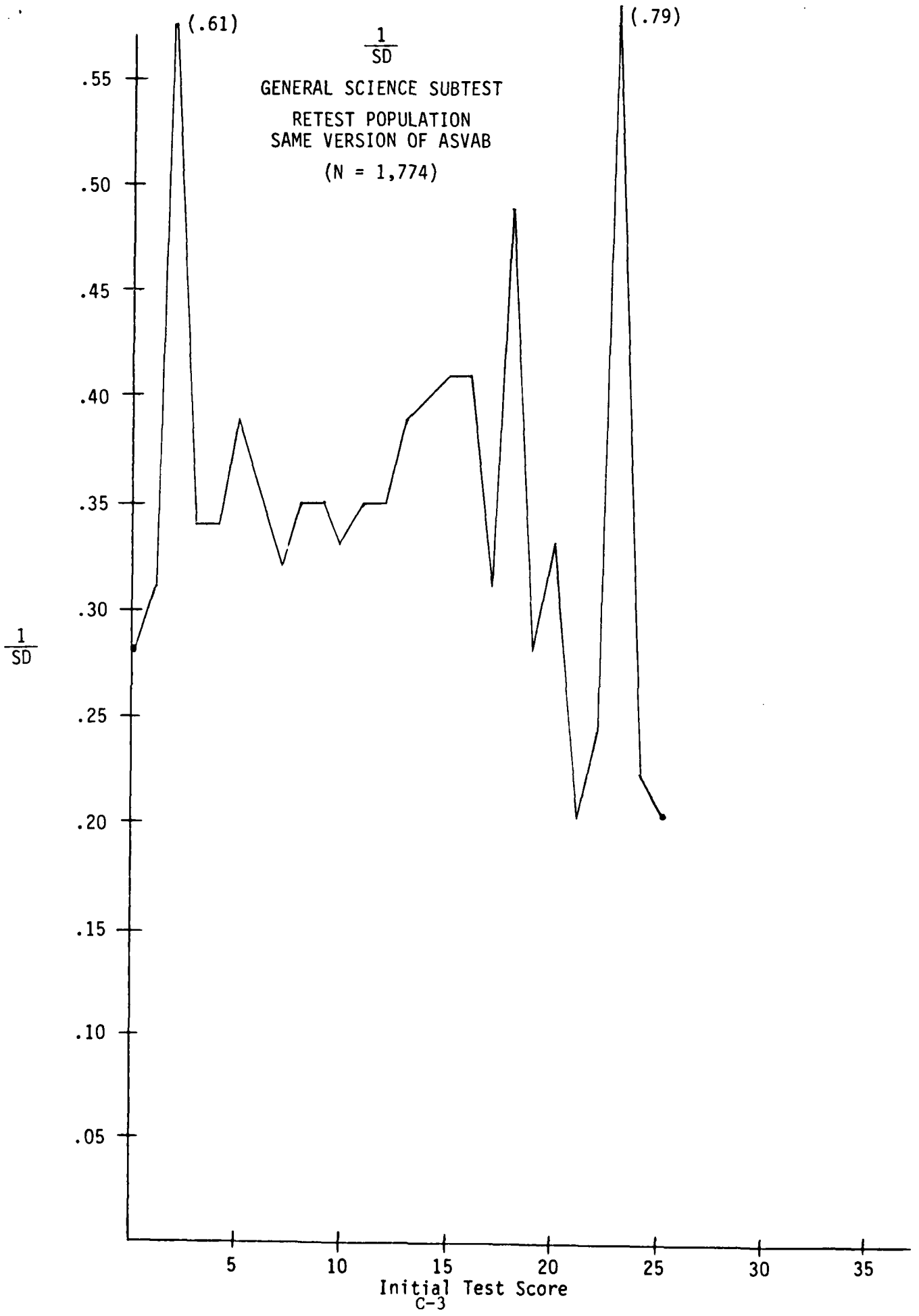
(N = 1,774)

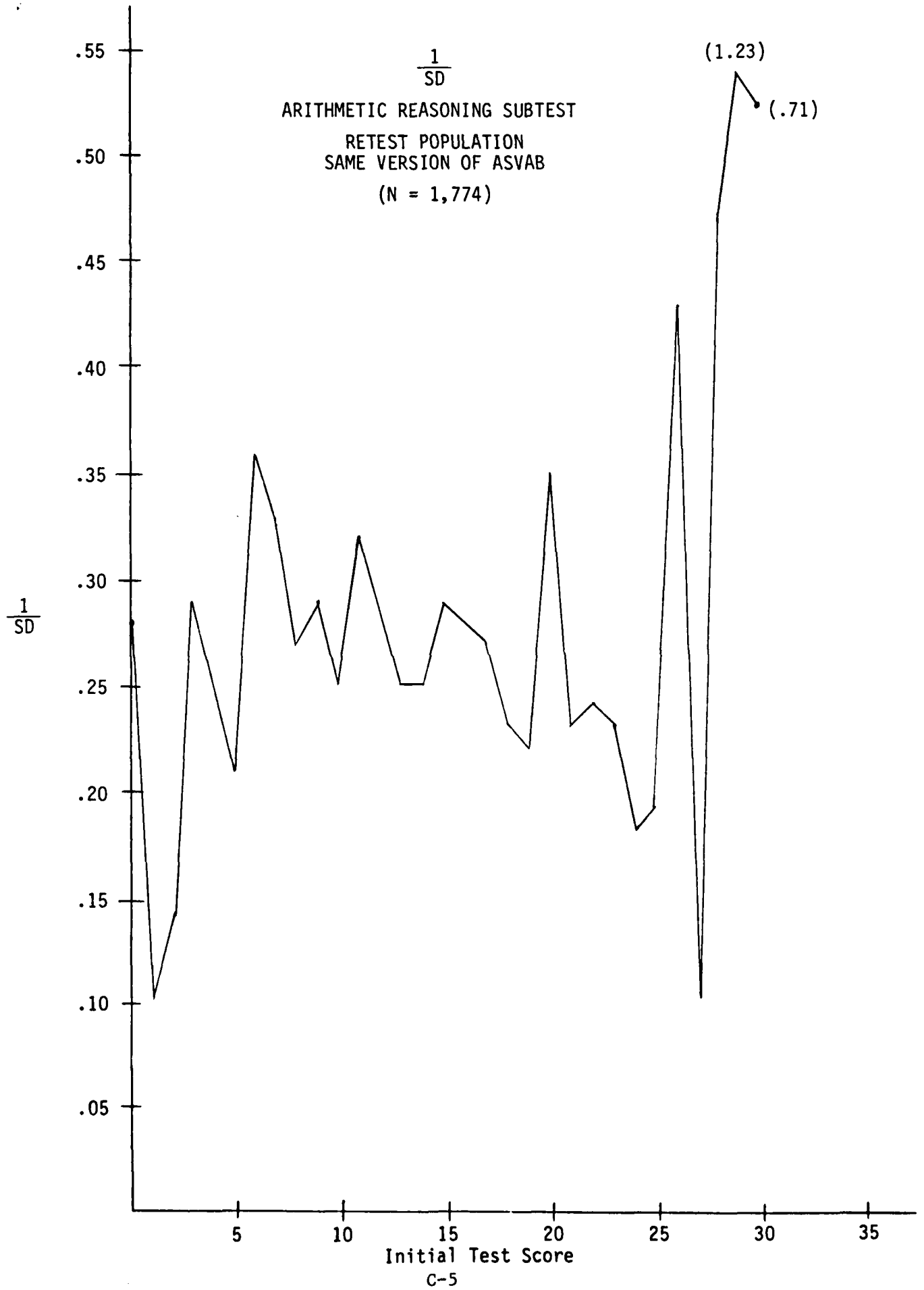


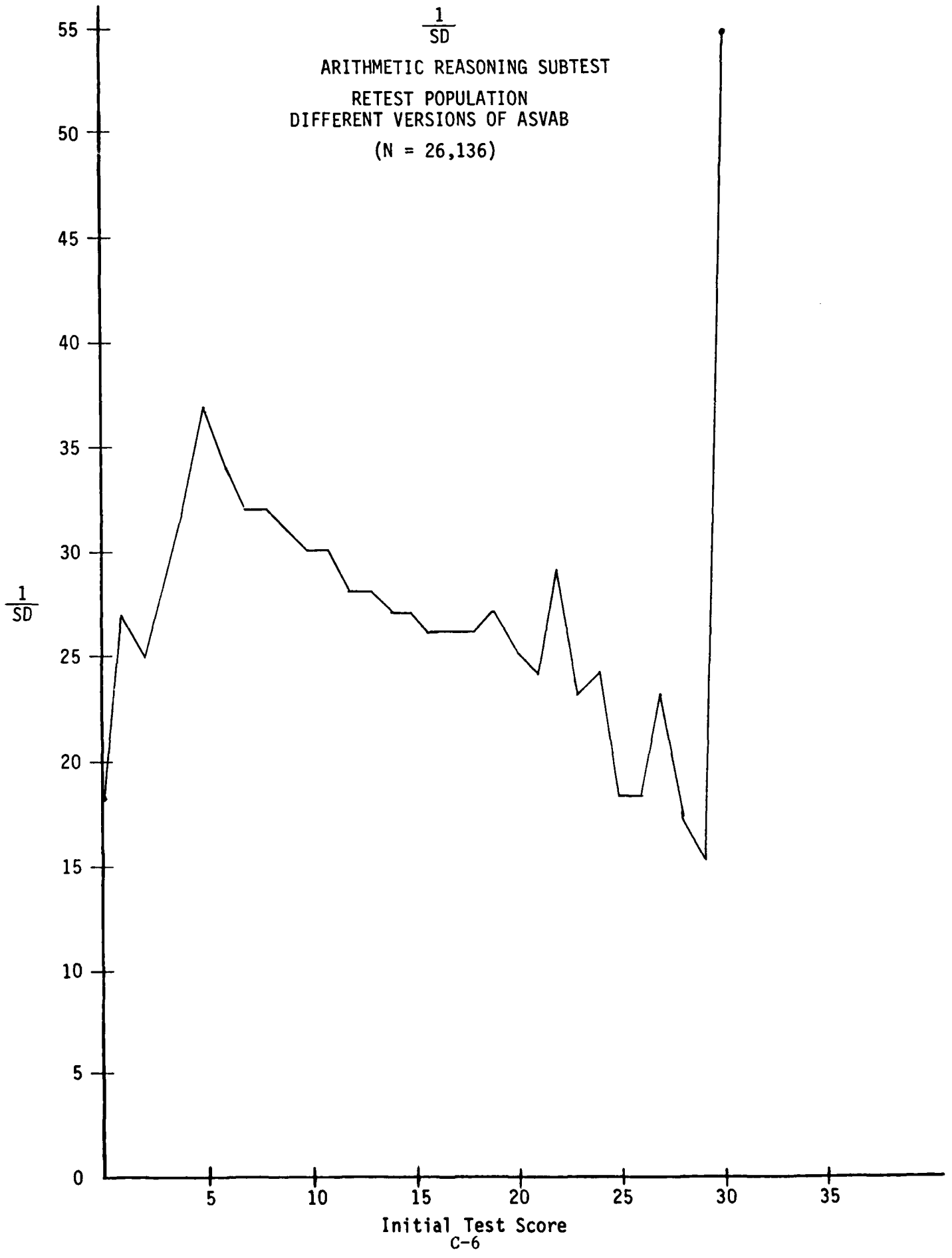

MEAN RETEST SCORE
ELECTRONICS INFORMATION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
Mean Retest Score
55
50
45
40
35
30
25
20
15
10
5
0
5
10
15
20
25
30
35
Initial Test Score

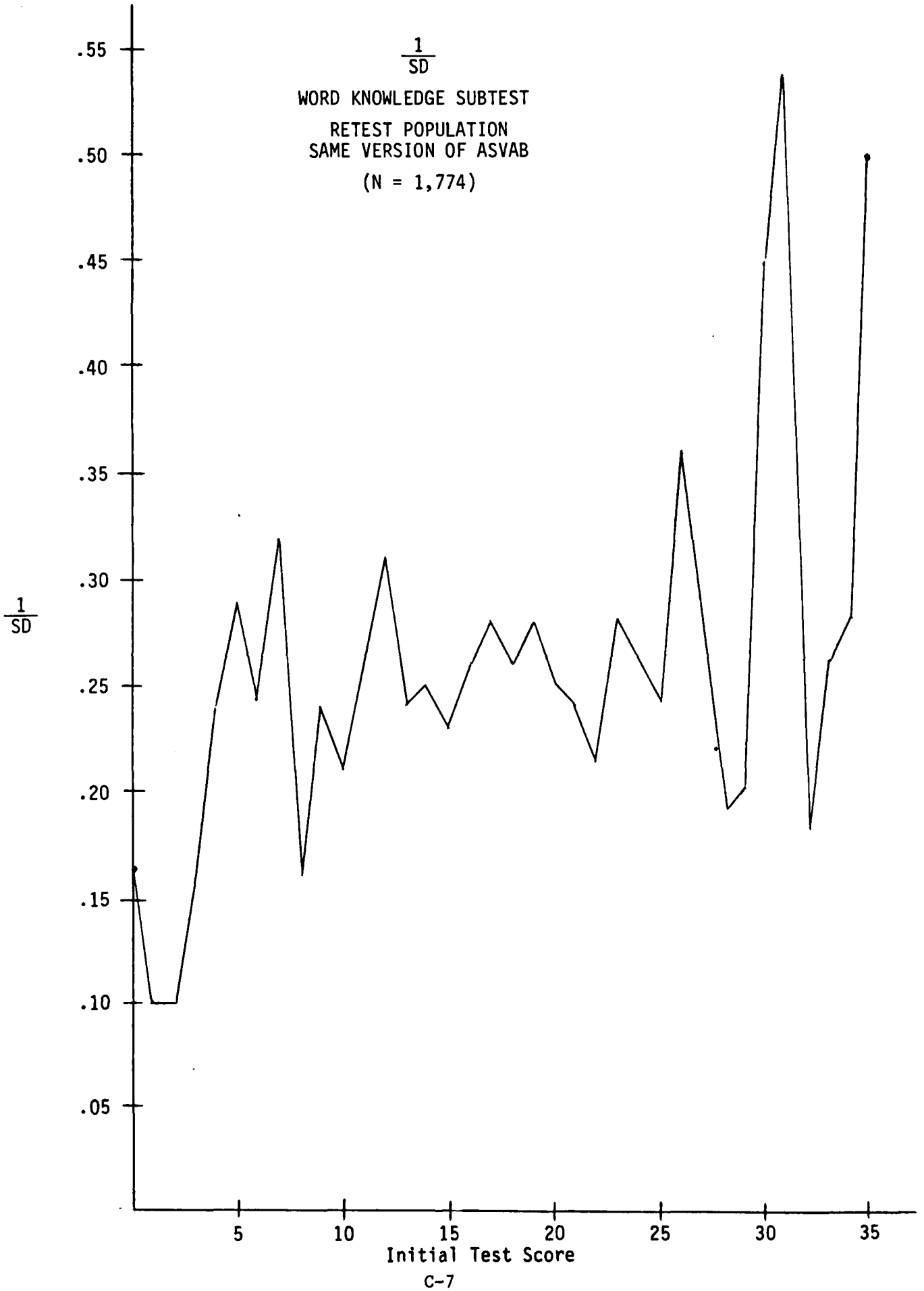
# APPENDIX C

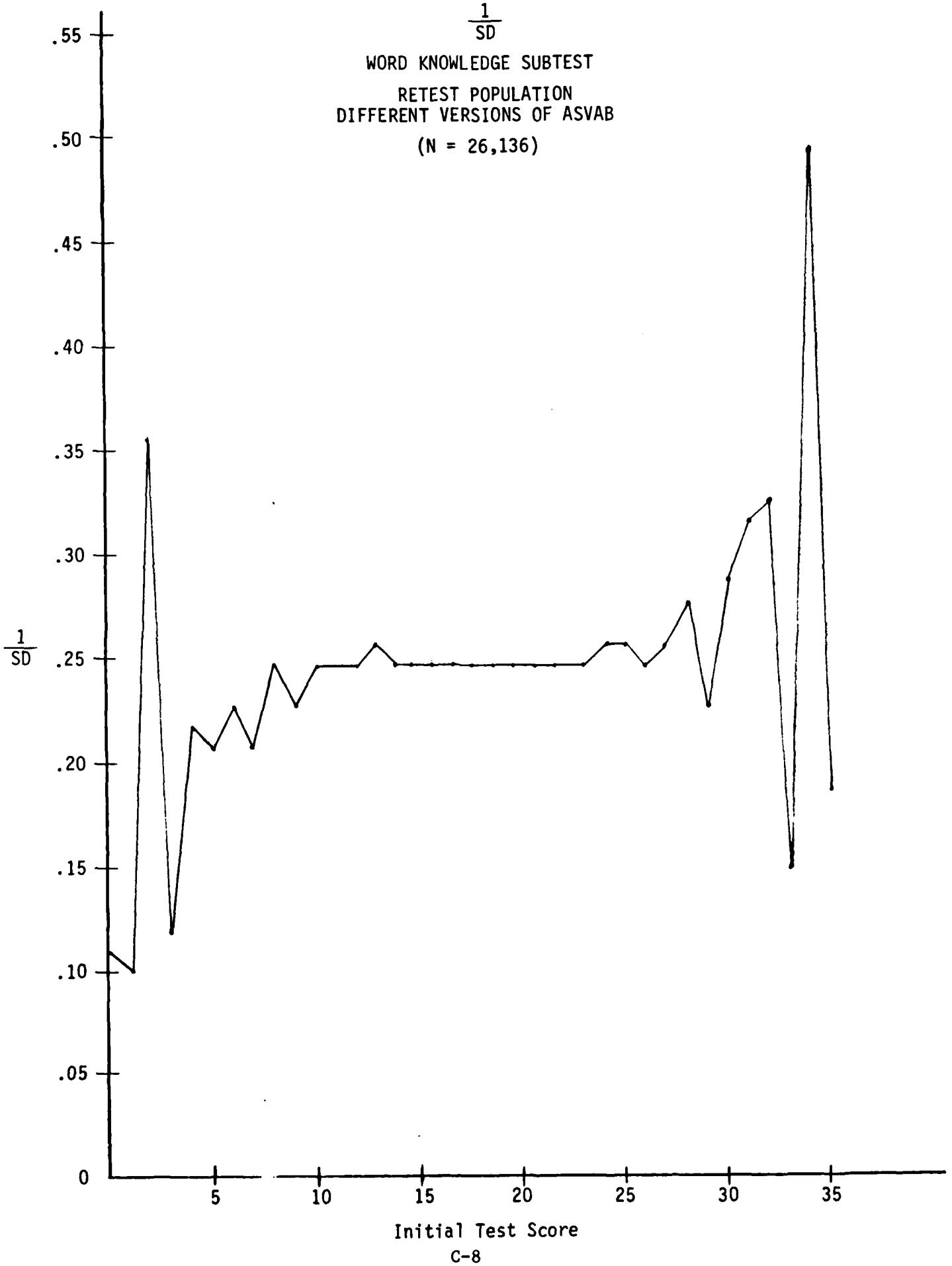
# INFORMATION FUNCTIONS FOR ASVAB SUBTESTS: RETESTED APPLICANT POOL

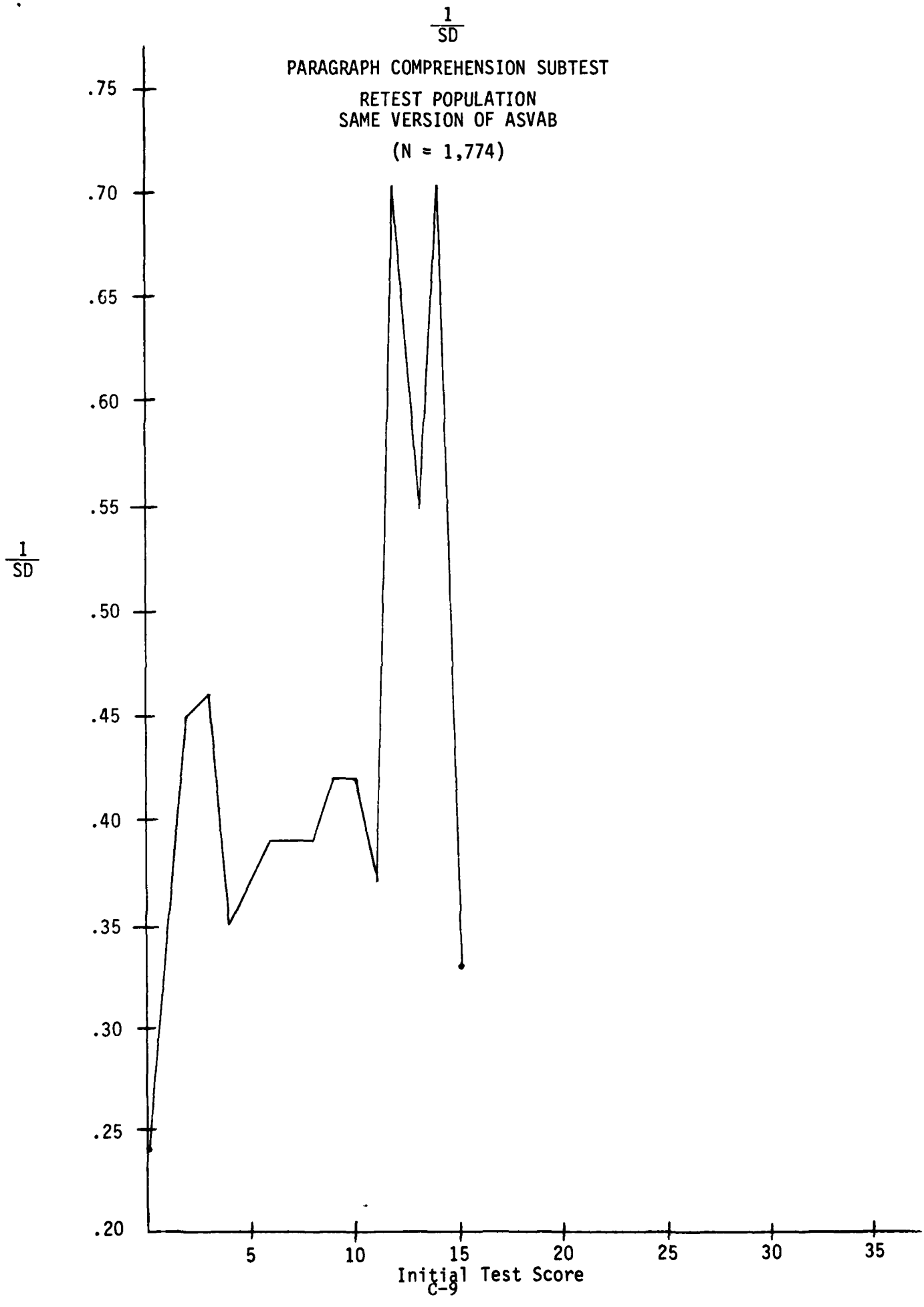

(.61)
(.79)
1/SD
GENERAL SCIENCE SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
1/SD
5
10
15
20
25
30
35
Initial Test Score

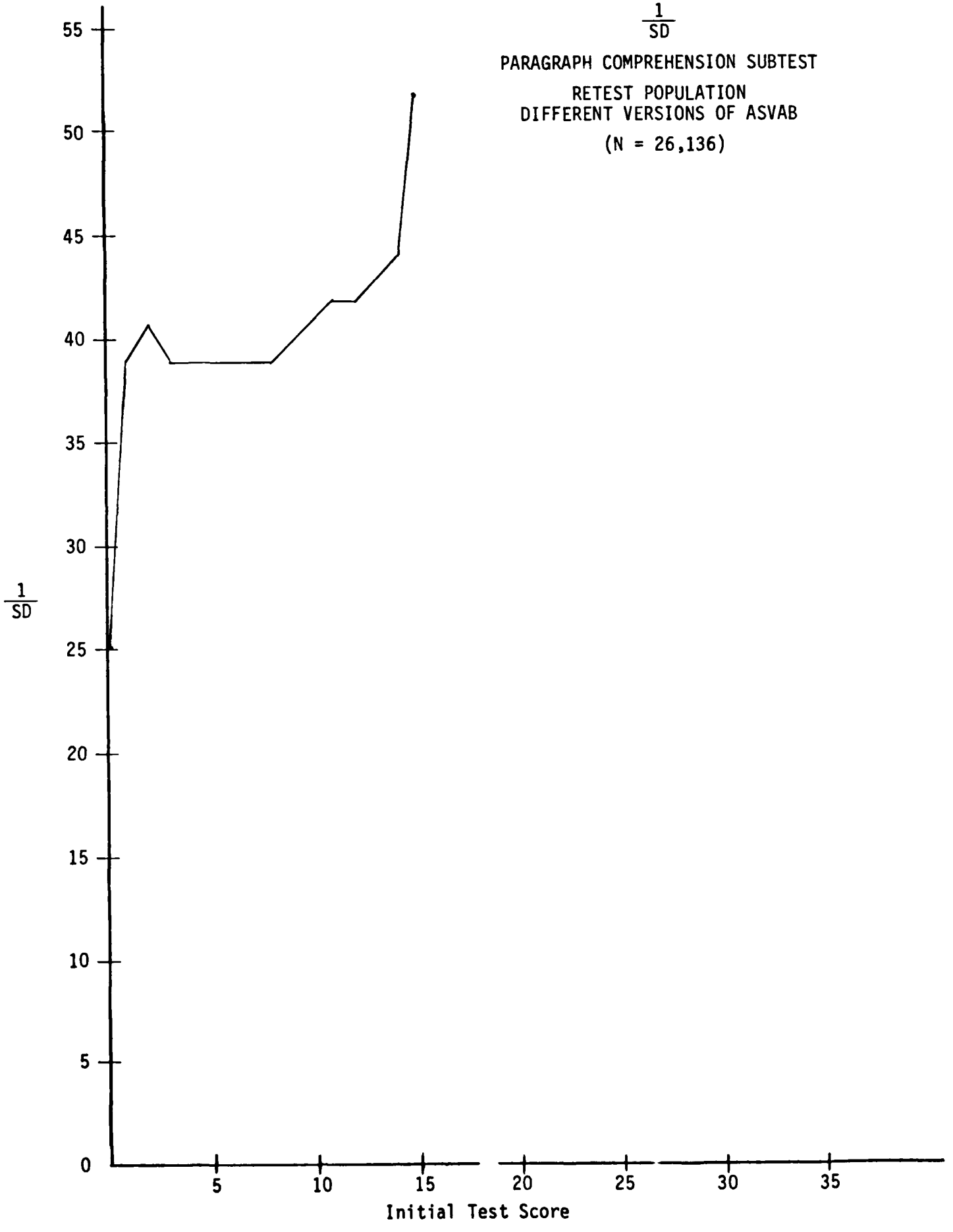

1/SD
ARITHMETIC REASONING SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
(1.23)
(.71)
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
1/SD
5
10
15
20
25
30
35
Initial Test Score

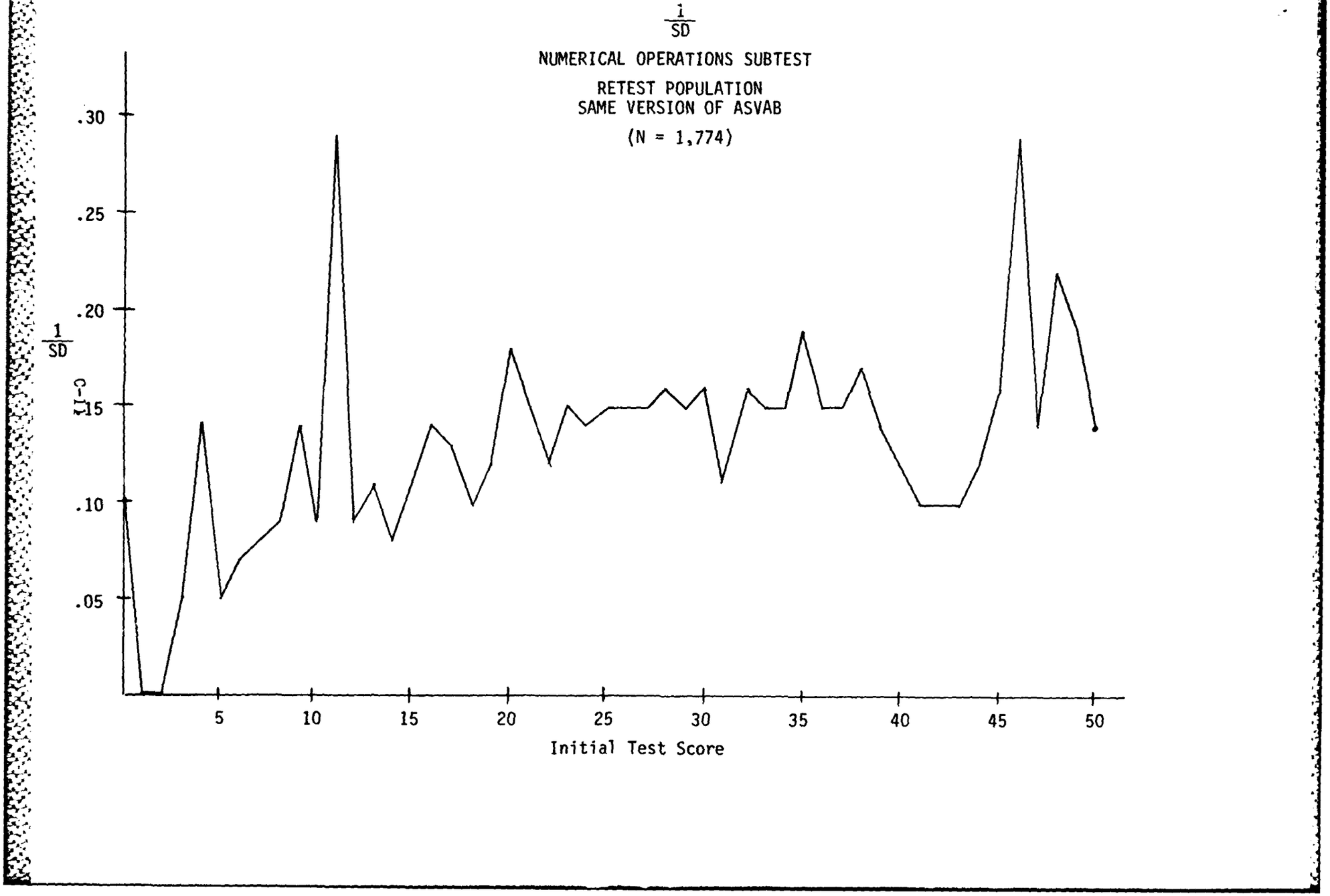

1/SD
ARITHMETIC REASONING SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
55
50
45
40
35
30
25
20
15
10
5
0
1/SD
5
10
15
20
25
30
35
Initial Test Score


1/SD
WORD KNOWLEDGE SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
1/SD
5
10
15
20
25
30
35
Initial Test Score


1/SD
WORD KNOWLEDGE SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
0
1/SD
5
10
15
20
25
30
35
Initial Test Score


1/SD
PARAGRAPH COMPREHENSION SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.75
.70
.65
.60
.55
.50
.45
.40
.35
.30
.25
.20
1/SD
5
10
15
20
25
30
35
Initial Test Score


1/SD
PARAGRAPH COMPREHENSION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
55
50
45
40
35
30
25
20
15
10
5
0
1/SD
5
10
15
20
25
30
35
Initial Test Score

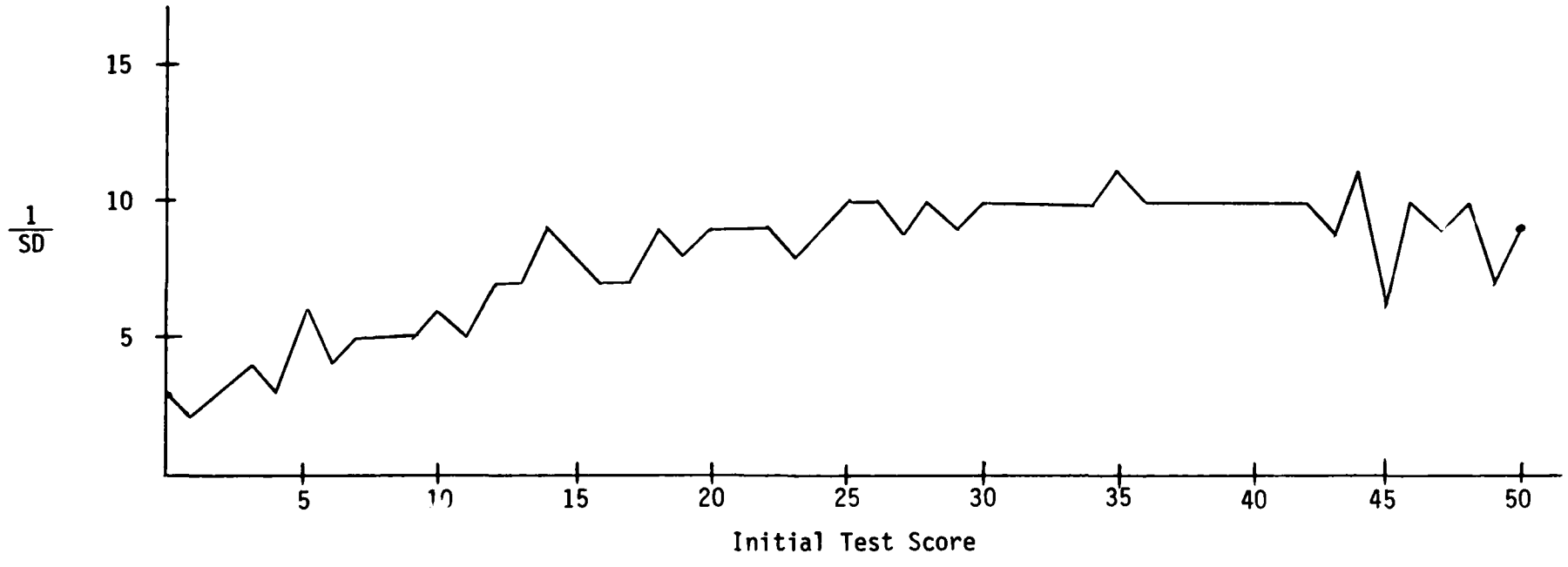

1/SD
NUMERICAL OPERATIONS SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.30
.25
.20
.15
.10
.05
1/SD
C-13
5
10
15
20
25
30
35
40
45
50
Initial Test Score

$\frac{1}{SD}$

NUMERICAL OPERATIONS SUBTEST

RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

(N = 26,136)

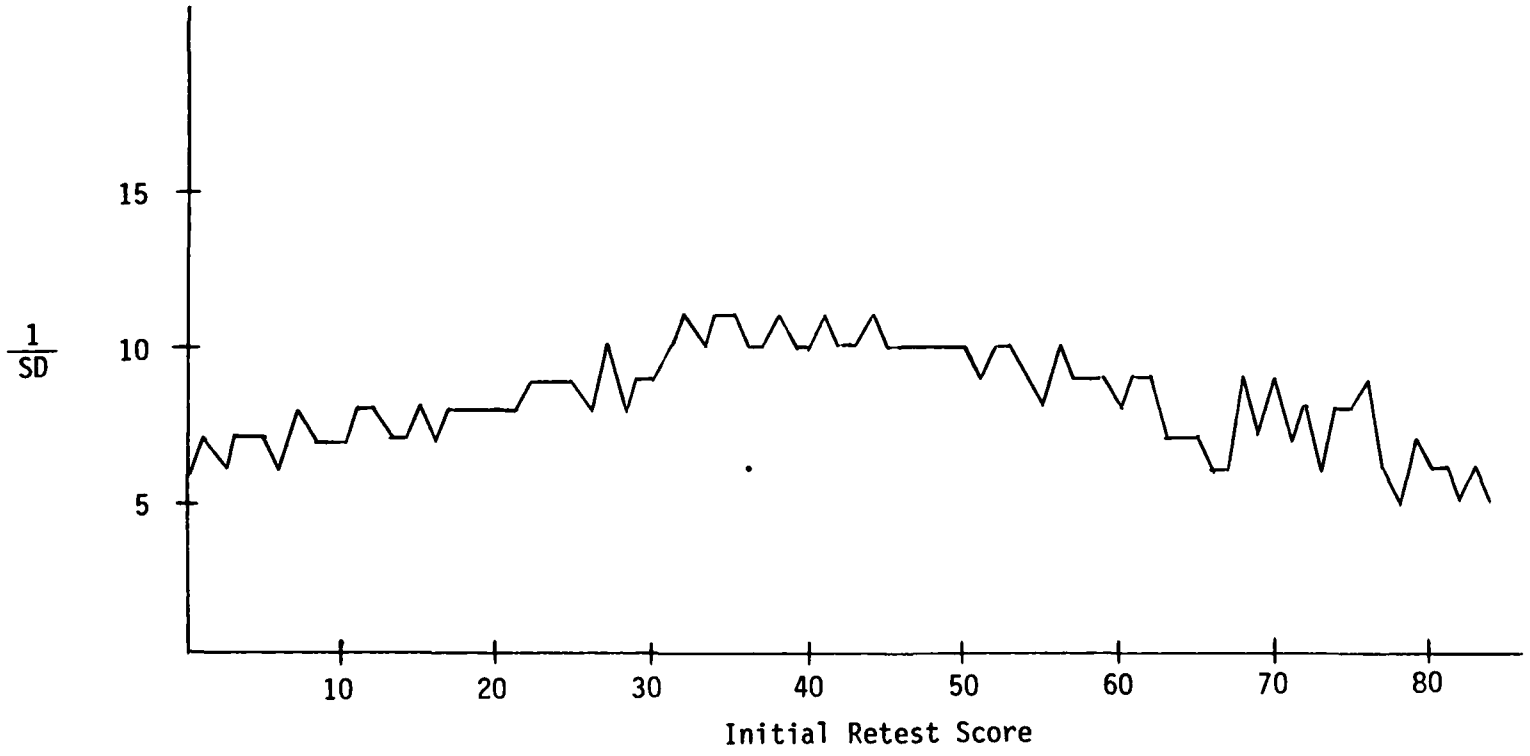


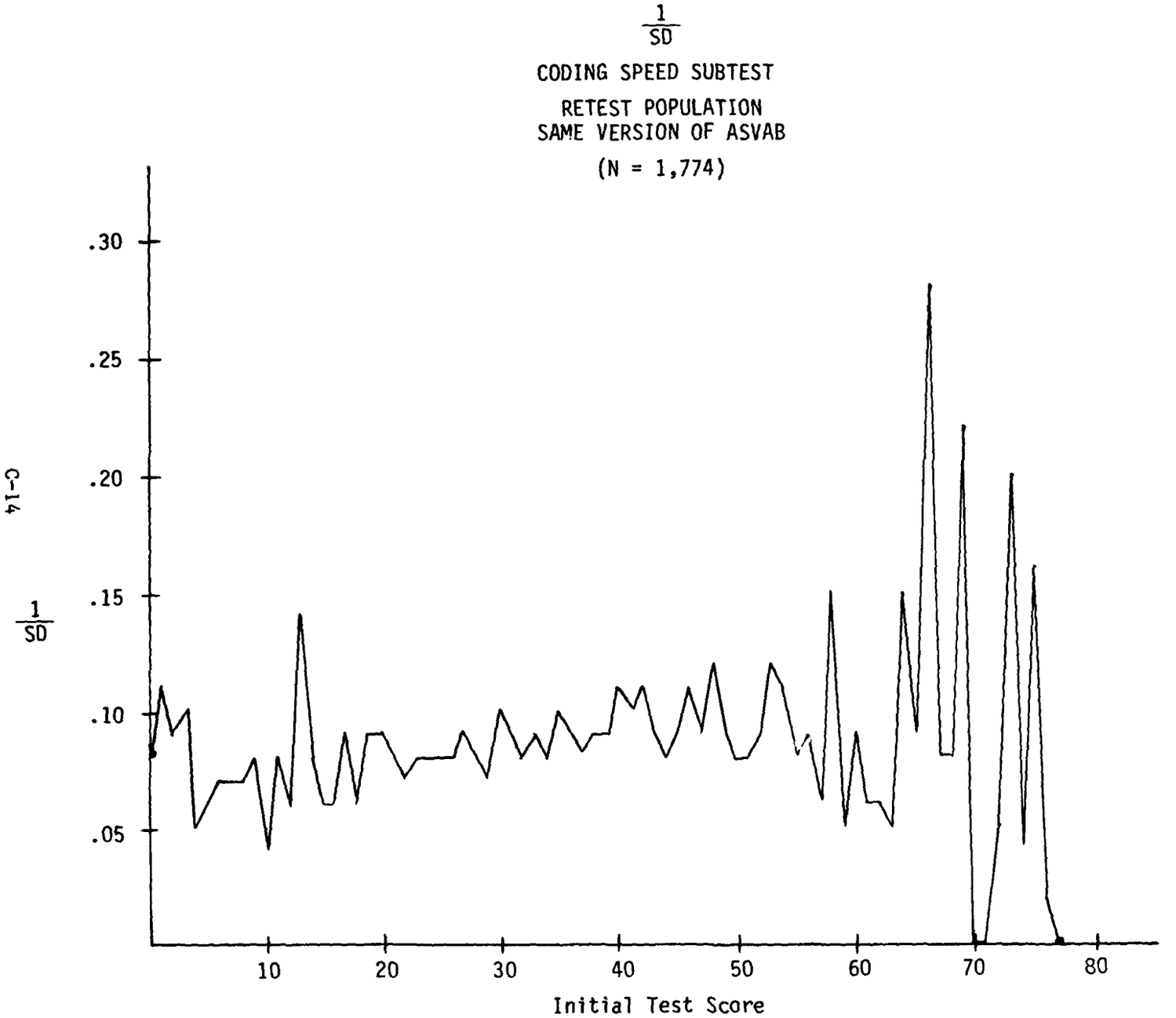
$\frac{1}{SD}$

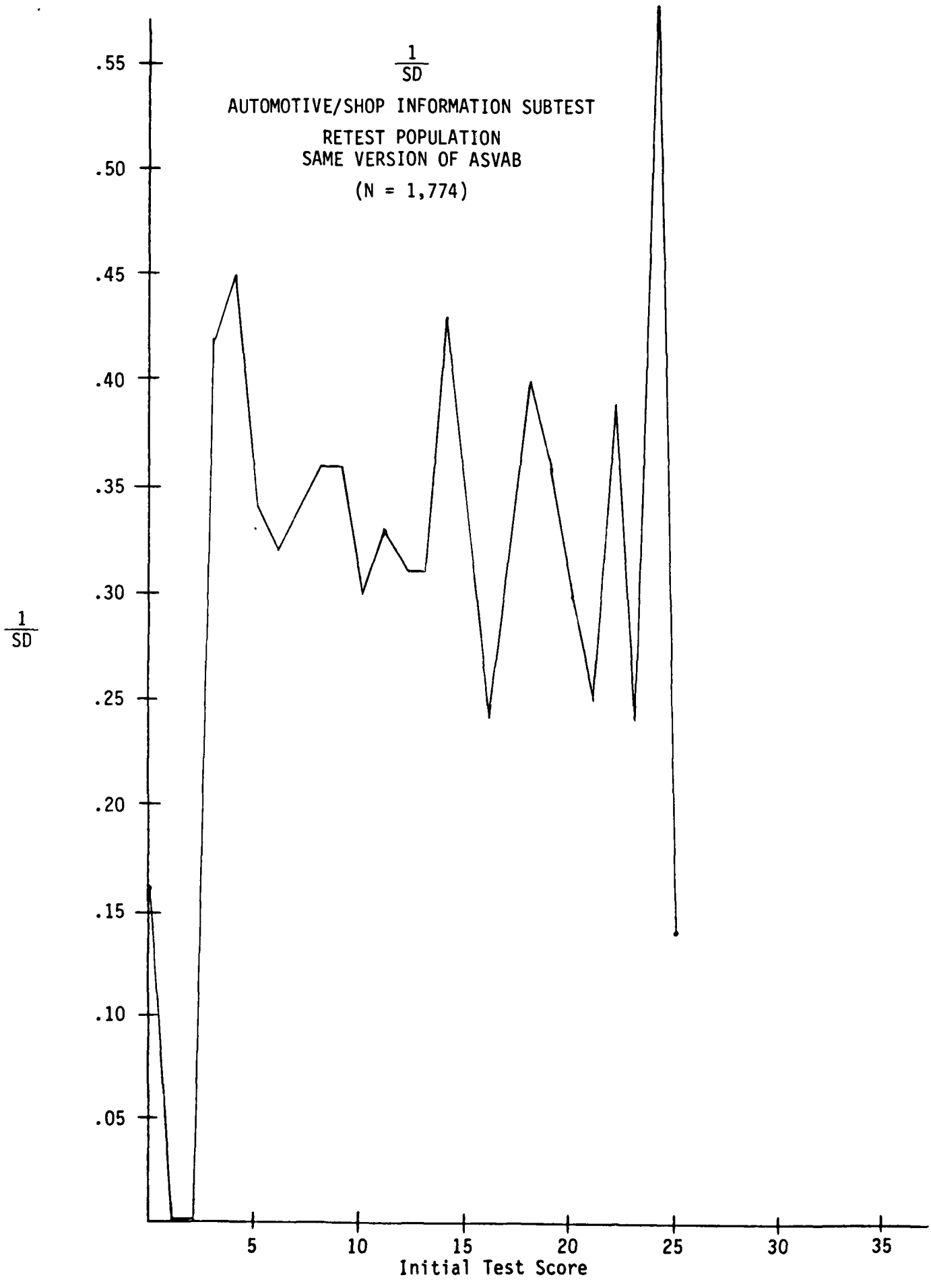
CODING SPEED SUBTEST

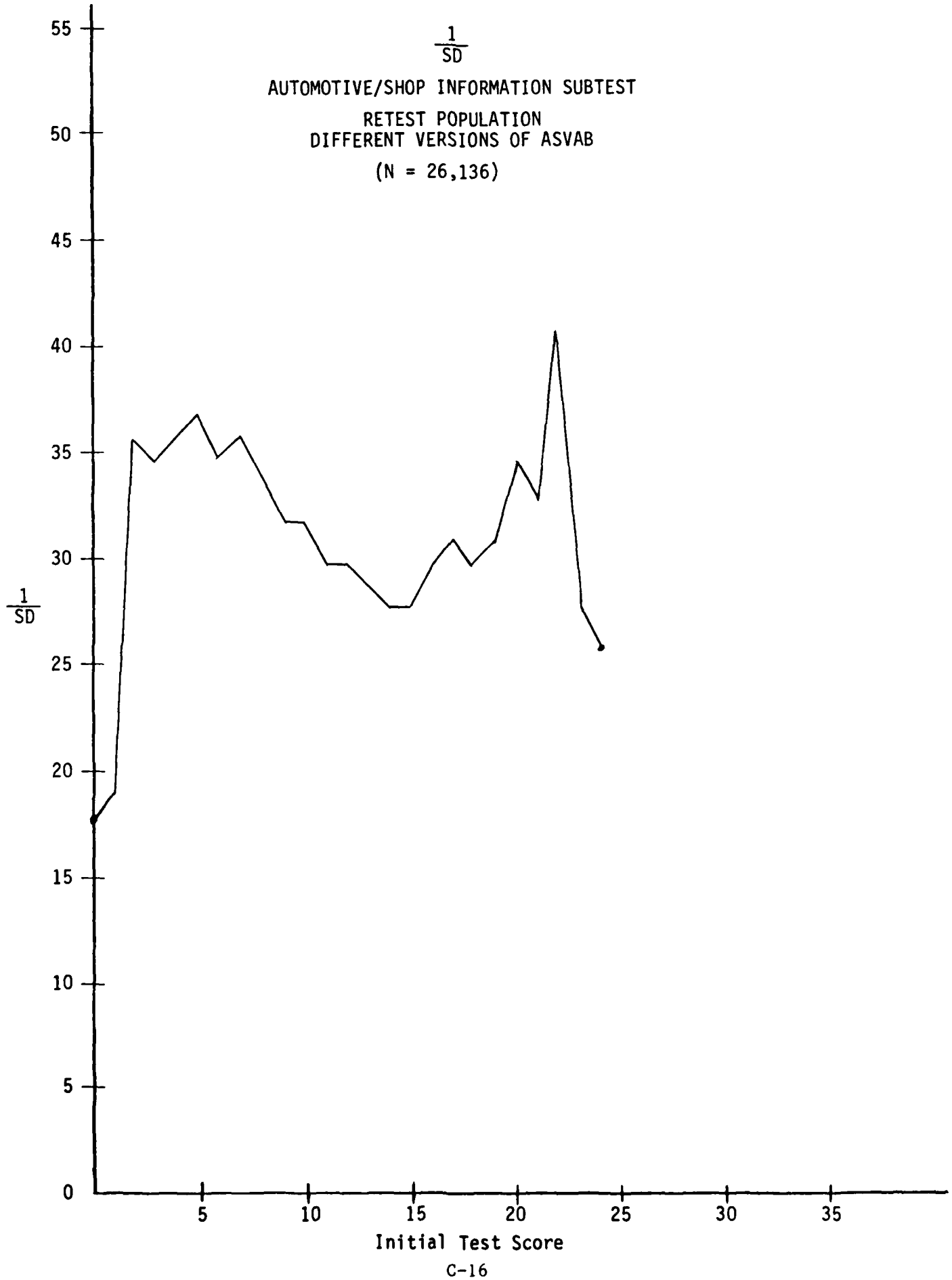
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB

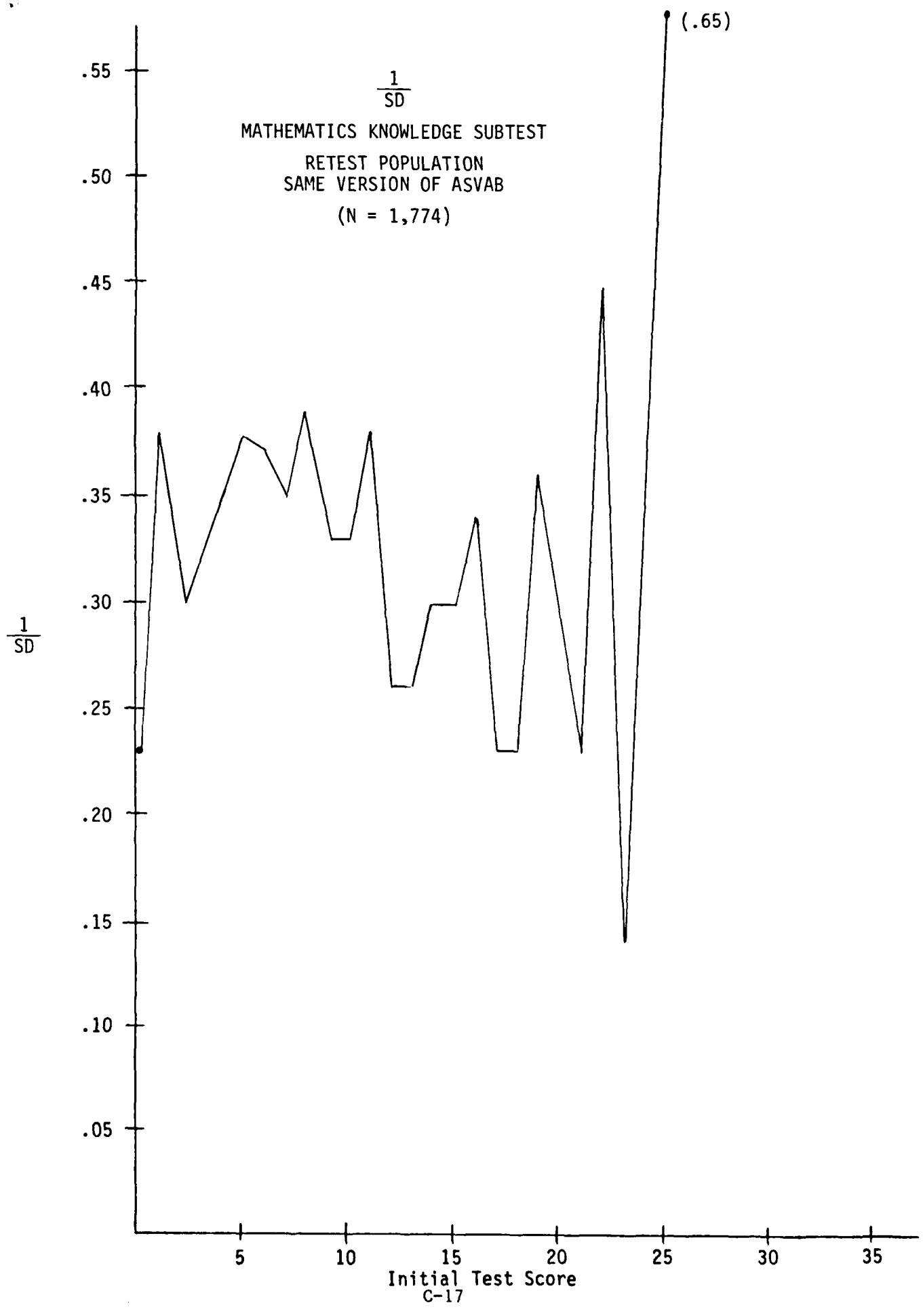
(N = 26,136)

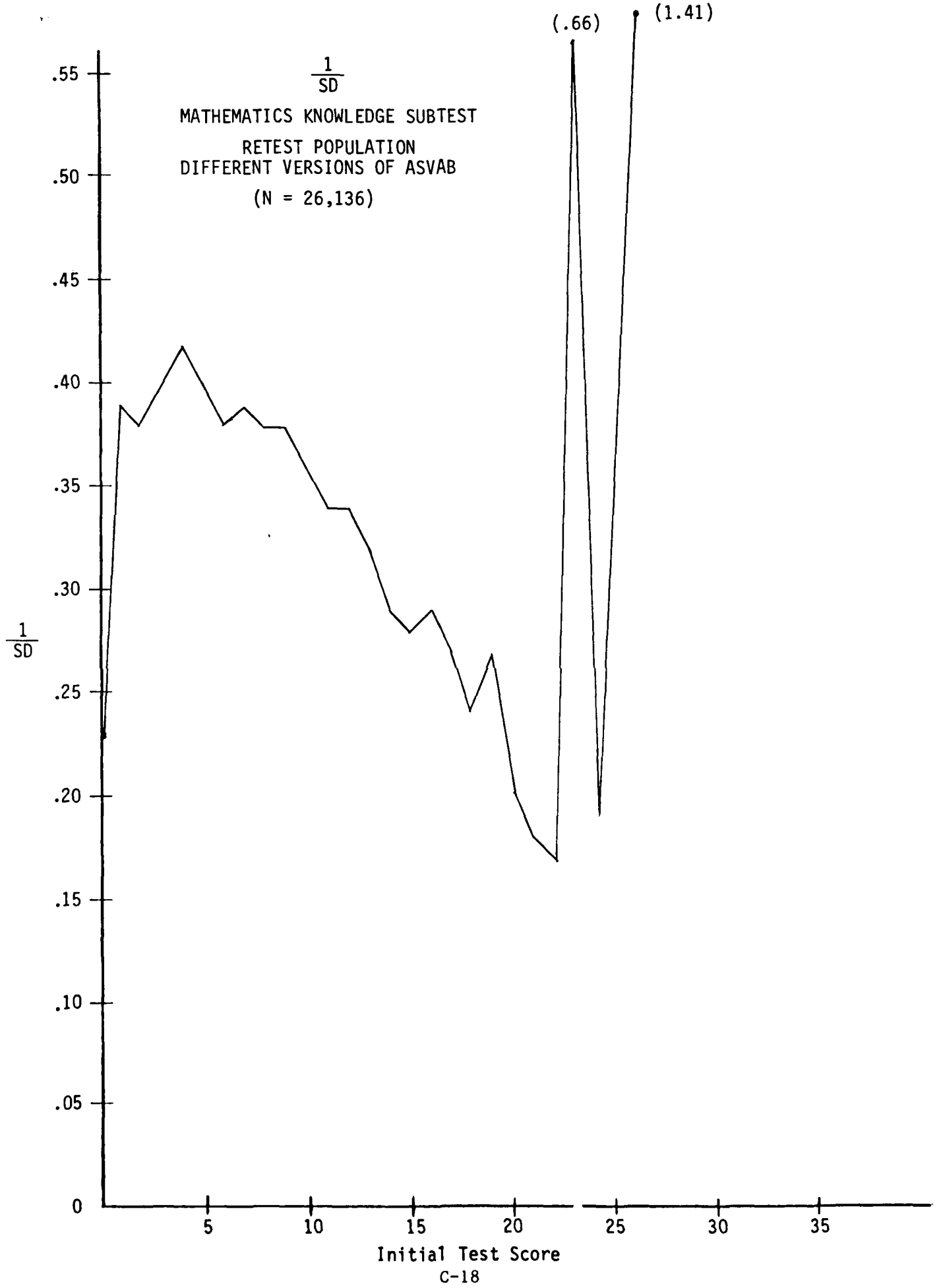



1/SD
CODING SPEED SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.30
.25
.20
.15
.10
.05
1/SD
10
20
30
40
50
60
70
80
Initial Test Score


1/SD
AUTOMOTIVE/SHOP INFORMATION SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
1/SD
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
5
10
15
20
25
30
35
Initial Test Score


1/SD
AUTOMOTIVE/SHOP INFORMATION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
55
50
45
40
35
30
25
20
15
10
5
0
1/SD
5
10
15
20
25
30
35
Initial Test Score


(.65)
1/SD
MATHEMATICS KNOWLEDGE SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
1/SD
5
10
15
20
25
30
35
Initial Test Score


(.66)
(1.41)
1/SD
MATHEMATICS KNOWLEDGE SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
0
1/SD
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10
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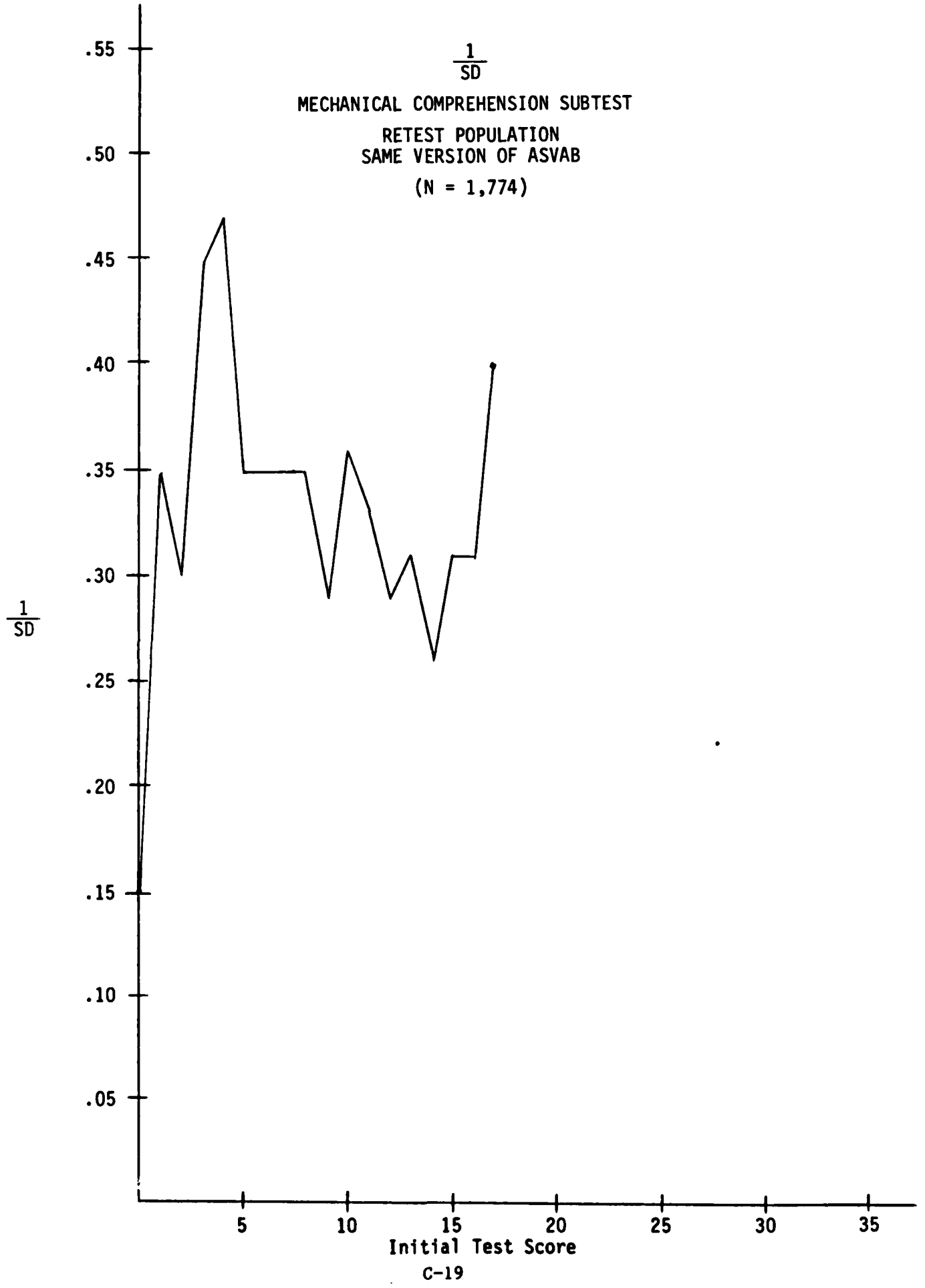
20
25
30
35
Initial Test Score


1/SD
MECHANICAL COMPREHENSION SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.55
.50
.45
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1/SD
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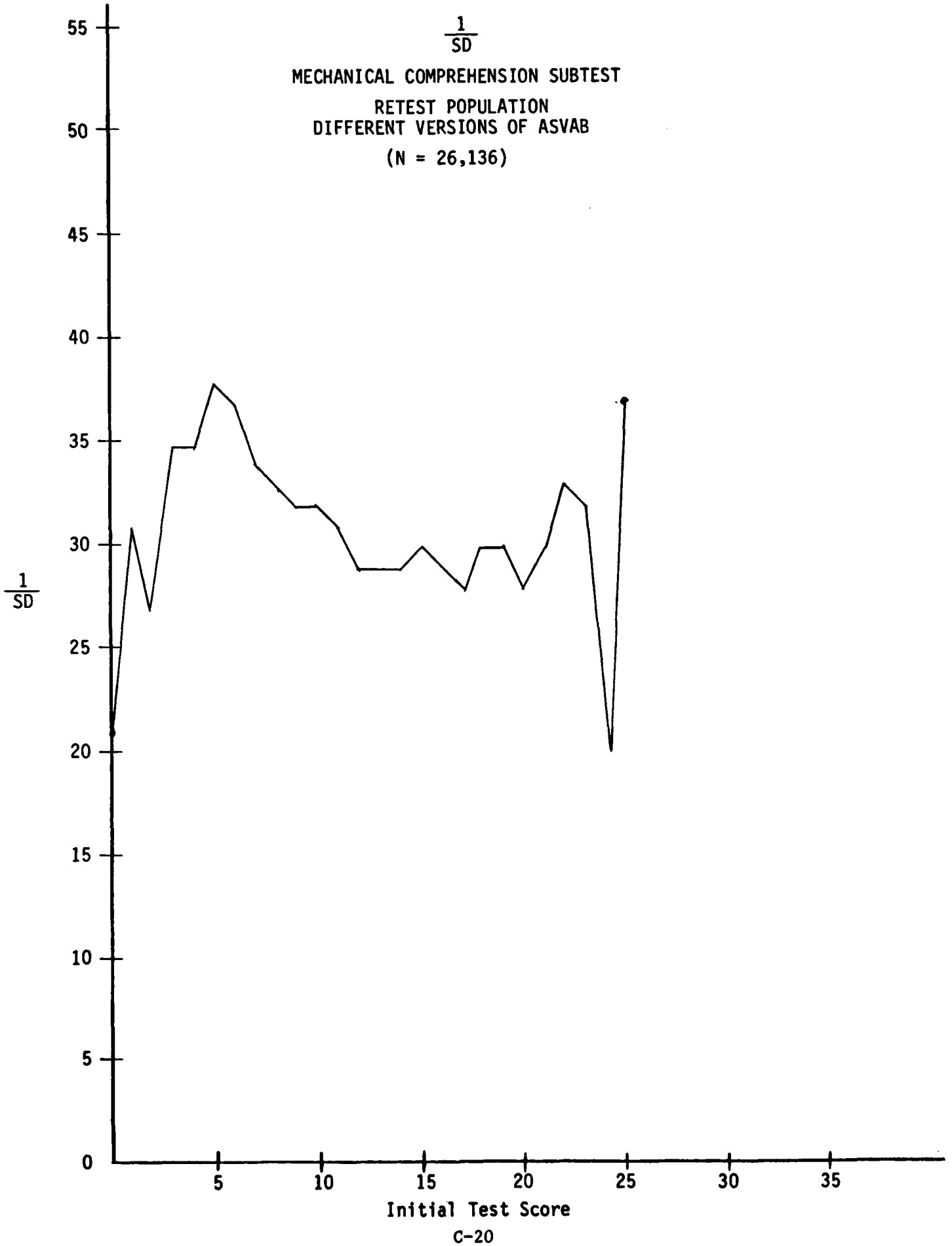
25
30
35
Initial Test Score


1/SD
MECHANICAL COMPREHENSION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
55
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1/SD
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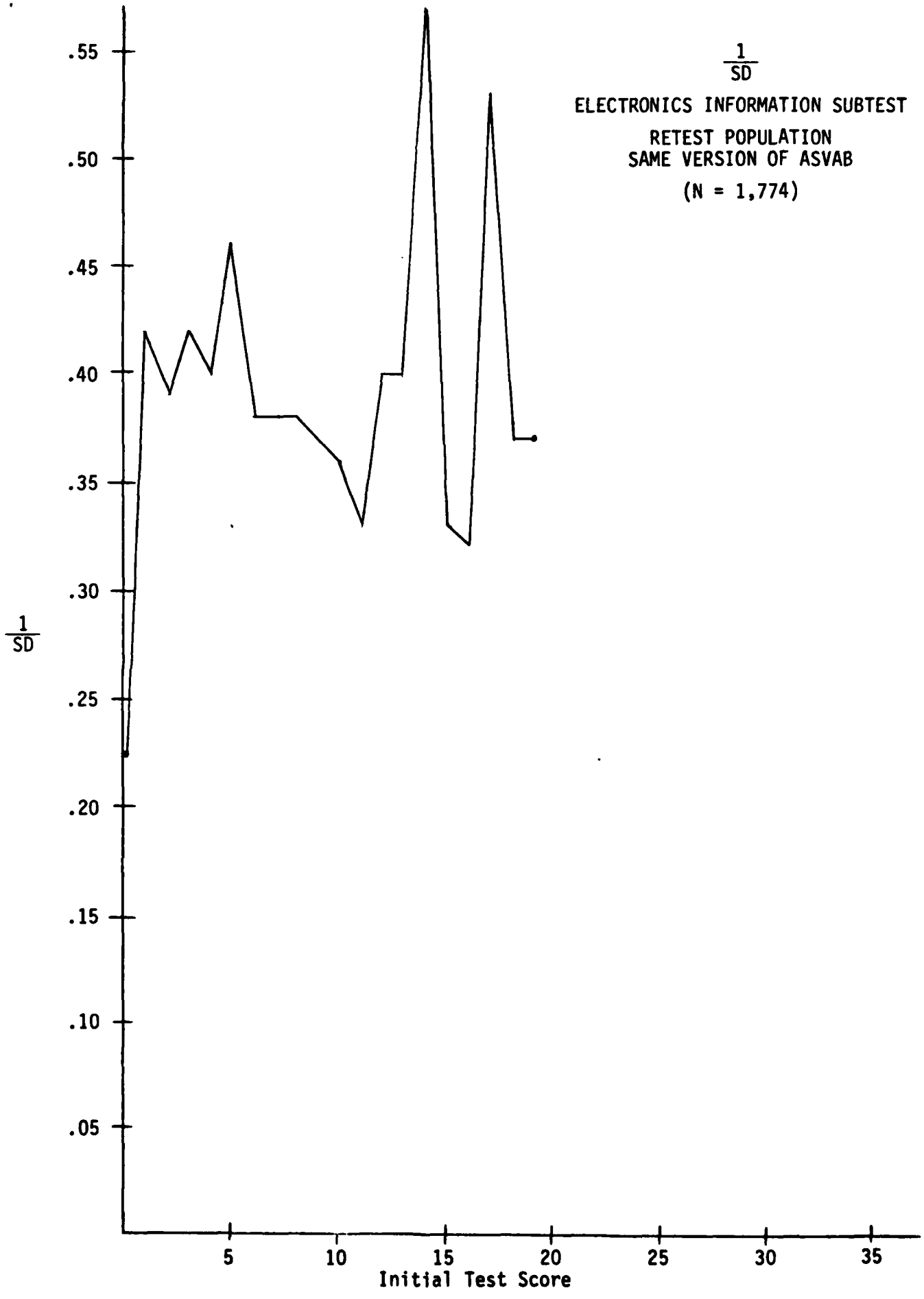
Initial Test Score


1/SD
ELECTRONICS INFORMATION SUBTEST
RETEST POPULATION
SAME VERSION OF ASVAB
(N = 1,774)
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
.05
1/SD
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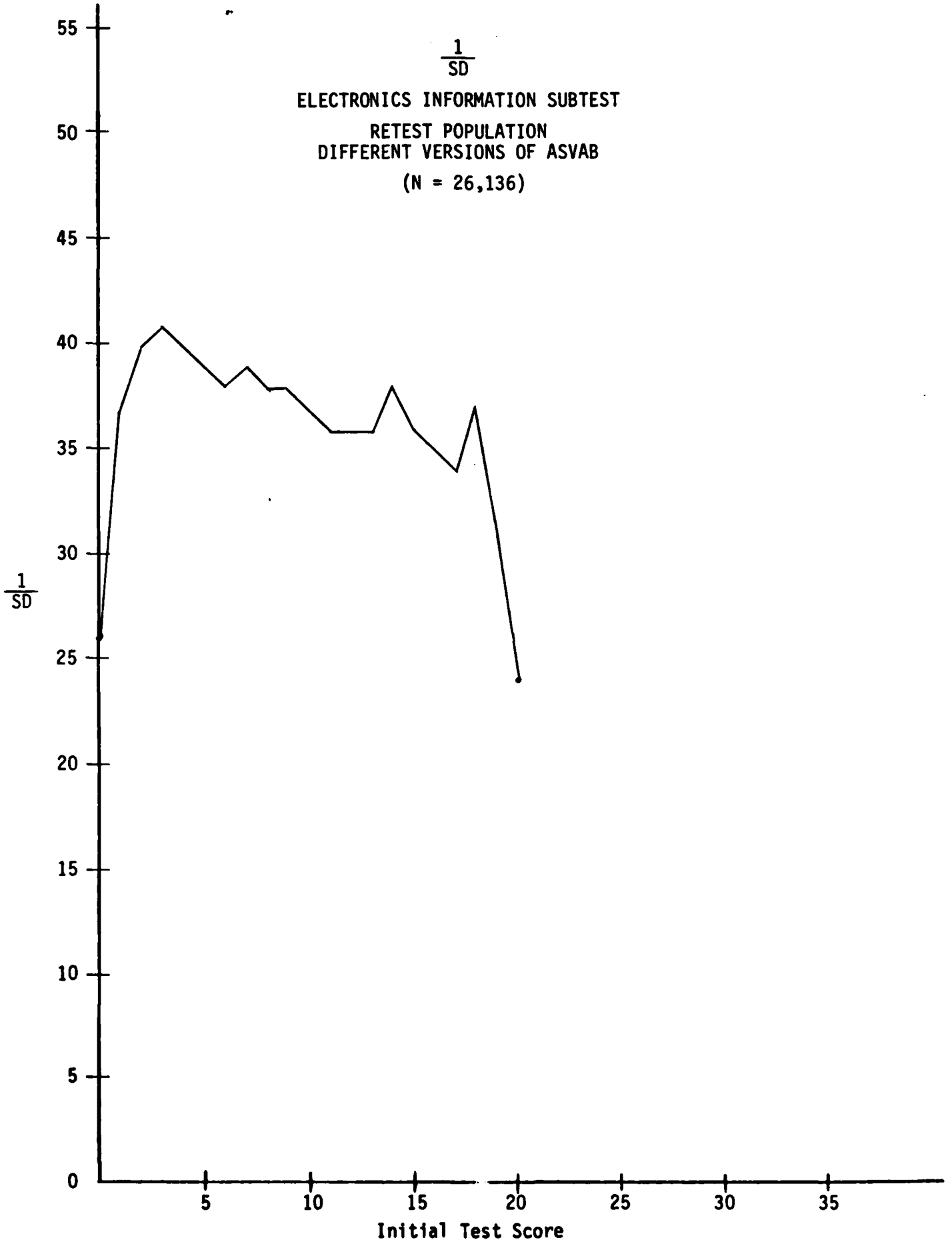
25
30
35
Initial Test Score


1/SD
ELECTRONICS INFORMATION SUBTEST
RETEST POPULATION
DIFFERENT VERSIONS OF ASVAB
(N = 26,136)
1/SD
55
50
45
40
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0
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30
35
Initial Test Score